Effects of cooperative governance in the sewage treatment works in the upper Vaal River

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Abstract

The Upper Vaal Water Management Area (Upper Vaal WMA) lies in the eastern interior of South Africa. This WMA includes the Vaal, Klip, Wilge, Liebenbergsvlei and Mooi Rivers and extends to the confluence of the Mooi and Vaal Rivers. It also includes major dams such as the Vaal Dam, Grootdraai Dam and Sterkfontein Dam. The southern half of the WMA extends over the Free State province; the north-east mainly falls within Mpumalanga and the northern and western parts in Gauteng and North West provinces respectively (DWAF 2004). Several wastewater treatment works (WWTW) located in this area do not meet the standard set by the present legislation that addresses proper treatment of water. This results in number of problems that affect the quality of water in this catchment.

It was noted by the WRC (2006b) that with the challenges of implementation in an environment of shared responsibility, it is increasingly recognised that public/government institutions must foster institutional cooperation and interaction for efficient provision of public services, both at the policy-strategy level and the operational-implementation level. According to WRC (2006b), poor cooperation between institutions in the implementation of their interrelated mandates has resulted in inefficient utilization of scarce resources and/or endless disputes.

In order to address this shortcoming, a study that investigated the effects of cooperative governance in the Wastewater Treatment Works (WWTW) in the Upper Vaal Water Management Area was initiated. The results of the research indicate a lack of cooperation between the three spheres of governance that participate in the sustainable management of water treatment in this area.

Key Words: Water; Cooperative governance; Upper Vaal; Wastewater Treatment Works; Water Management Area

Opsomming

Die Bo-Vaal Waterbestuursarea (Bo-Vaal WBA) is geleë in die oostelike gedeelte van Suid-Afrika. Die Bo- Vaal WBA sluit in die Vaal-, Klip-, Wilge-, Liebenbergsvlei en die Mooirivier en strek tot by die samevloeiing van die Mooi- en die Vaalriviere. Belangrike damme soos die Vaaldam, die Grootdraaidam en die Sterkfonteindam is ook in die WBA geleë. Die suidelike helfte van die WBA strek oor die Vrystaat, terwyl die Noord-Oostelike gedeelte hoofsaaklik in Mpumalanga- en die Westelike gedeelte in Gauteng en die Noordwes-provinsie respektiewelik geleë is (DWAF 2004). 'n Aantal rioolwerke geleë in die gebied voldoen nie aan die vereiste standaarde soos wat tans in huidige wetgewing vervat word m.b.t. die behoorlike behandeling van stedelike afvalwater nie. Dit het tot gevolg dat verskeie probleme die watergehalte in die WBA nadelig beinvloed.

Dit is opgemerk deur die WRC (2006b) dat in ‘n omgewing van gedeelde verantwoordelikheid, dit al hoe meer duidelik word dat die publieke/staatsinstansie inter-institusionele samewerking en kooperasie vir effektiewe publieke dienslewering, beide op die beleid-strategievlak en die operasionele-implementeringsvlak, benodig word. Volgens die WRC (2006b) het swak samewerking tussen die instansies vir die implimentering van hul onderskeie mandate tot gevolg gehad dat skaars hulpbronne oneffektief benut is en/of het dit eindelose dispuut tot gevolg gehad.

Ten einde ondersoek in te stel na die redes vir hierdie situasie, is 'n studie geloods wat die impak van Samewerkende Regering in die Afvalwaterbehandelingsaanlegte in die Bo-Vaal WBA ondersoek. Die navorsingsresultate het aangedui dat daar 'n gebrek aan samewerking tussen die drie sfere van regering is wat deelneem aan die volhoubare bestuur van waterbehandelingsaanlegte in die gebied.

Sleutelwoorde: Water; samewerkende regering; Bo-Vaal; Afvalwaterbehandelingswerke; Waterbestuursarea,

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List of Abbreviations

AMD	Acid Mine Drainage
CFO's	Chief Financial Officer's
CMA	Catchment Management Agency
COGTA	Cooperative Governance and Traditional Affairs
CSIR	Council for Scientific and Industrial Research
DBSA	Development Bank of Southern Africa
DEAT	Department of Environmental Affairs and Tourism
DORA	Division of Revenue Act
DPLG	Department of Provincial and Local Government
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
GDP	Gross Domestic Product
HSRC	Human Science Research Council
IRFA	Inter-governmental Relations Framework
MIG	Municipal Infrastructure Grant
OSD	Occupation Specific Dispensation
SA	South Africa
SALGA	South African Local Government Association
WBA	Waterbestuursarea
WDCS	Waste Discharge Charge System
WISA	Water Institutes of South Africa
WMA	Water Management Area
WRC	Water Research Commission
WRM	Water Resource Management
WSA	Water Services Authority
WWTW	Wastewater Treatment Works

CHAPTER1

1.1 INTRODUCTION

Since 1994 the Department of Water Affairs had gradually transferred water service delivery to the municipalities. This shift was made with a view to the provision of services by local government while the Department would focus on strong sector leadership, policy and strategy development, water security, partnerships, regulation and information. At present the Department supports the sector, requiring local government to meet the regulatory requirements. The Department would continue to manage the Regional Bulk Infrastructure Fund for Water Services, to deal with ageing waste water treatment plants and to collaborate with Development Bank of Southern Africa (DBSA).

South Africa (SA) has three spheres of government: national, provincial and local. These authorities have environmental roles, responsibilities, and mandates to carry out, which are different but interrelated. These functions are performed in terms of the South African Constitution and other legislation. To avoid conflict among different spheres of government governed by different legislation aimed at managing the environment, cooperative action must be taken. Chapter 3 of the Constitution of the Republic of South Africa (Act no 108 of 1996) (Hereafter, the Constitution) requires all organs of state and spheres of government to observe and adhere to the principles and conduct their activities within the parameters of cooperative governance. As part of cooperative governance, SA developed the Inter-governmental Relations Framework, 2005 (Act 13 of 2005) (IRFA). The purpose of the IRFA is to promote and facilitate intergovernmental relations and provide for mechanisms and procedures to facilitate the settlement of intergovernmental disputes. IRFA was developed to give effect to Section 42(2) of the 1996 Constitution.

DEAT (2008) reported that water resources are stressed by increasing pollutant loads, which include industrial effluents, domestic and commercial sewage, acid mine drainage, agricultural runoff and litter. According to Mema (undated), the many investigations conducted so far have indicated that wastewater and sewage effluent from treatment plants and deteriorating infrastructure are major sources of pollution, contributing to a number of pollutants found in water resources. This study aims to identify the effectiveness of cooperative governance towards the management of Wastewater

Treatment Works (WWTWs) in the Upper Vaal Water Management Area (WMA). There are other role players involved in the water quality management besides the three spheres of government: science councils such as Water Research Commission (WRC), Council for Scientific and Industrial Research (CSIR) and Human Science Research Council (HSRC), academic institutions, water utilities and service providers, non-governmental bodies, consultants and professional organizations such as the Water Institutes of South Africa (WISA).

The National Water Act allows the discharge of effluent into the water resource in a sustainable way. Water users are allowed to take some precautionary measures before discharging waste water into the water resource. Many communities are still relying on untreated water from surface water resources for their daily supply (DWAF, 2002). Therefore it is very critical for the water users to comply with the Department's required discharge standards and to avoid polluting the water resources. Section 24 (b) (ii) of the Constitution, guarantees everyone the right to having "the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

1.2 PROBLEM STATEMENT

The Upper Vaal WMA lies in the eastern interior of South Africa. This WMA includes the Vaal, Klip, Wilge, Liebenbergsvlei and Mooi River and extends to the confluence of the Mooi and Vaal River. It also includes very important dams: Vaal Dam, Grootdraai Dam and Sterkfontein Dam. The southern half of the WMA extends over the Free State; the North-East mainly falls within Mpumalanga; and the Northern and Western parts in Gauteng and North West. This WMA makes huge contribution to the country's GDP (DWAF, 2004(b)). The Constitution and present government prioritised service delivery to previously excluded citizens in the second economy. In order to achieve this, the government developed a cooperative governance structure comprised of national, provincial and local spheres with distinctive, interdependent and specific roles and responsibilities. The national government is responsible for regulatory development and support while local government is tasked with actual service delivery including but not

limited to wastewater treatment. This is in line with Section 41 of the Constitution of the Republic of South Africa (Act no 108 of 1996).

According to WRC (2006b), there are challenges of implementation in an environment of shared responsibility, it was also recognised that public/government institutions must foster institutional cooperation and interaction for efficient provision of public services, both at the policy-strategy level and the operational-implementation level. Poor cooperation between institutions in the implementation of their interrelated mandates has resulted in inefficient utilization of scarce resources and/or endless disputes.

Sadly, this study confirms that non-compliance offences are still a challenge for enforcement in a cooperative governance context, hence detrimental effects on human health and environment.

The purpose of this study is to outline interrelationships of the three spheres of governance and determine detrimental effects on the environment and human health emanating from non-compliance of sewage treatment works in the Upper Vaal.

1.3 METHODOLOGY

A qualitative research method was used. An understanding of the problem was firstly developed by a review of the literature on the current status of the WWTW of the area and the impacts of discharging untreated or partially treated wastewater into a water resource. Thereafter, questionnaires were developed by the researcher and completed by officials from the Department of Water Affairs and officials from the Water Service Authorities. The results obtained were subsequently interpreted. Based on these results, recommendations were made to improve practice.

CHAPTER 2: LITERATURE REVIEW

2.1 DEFINING COOPERATIVE GOVERNANCE

According to Mhone and Edigheji (2003), cooperative government is: a partnership among the three spheres of government. This requires each sphere to fulfill a specific role and give greater legitimacy to democratic regimes, their policies and outcomes which are products of accommodation, compromise and at times consensus, rather than those based on the exclusion of key sectors of society, which in turn fosters conflict.

According to Ismail et al (1997), cooperative government is an innovative concept to resolve problems related to intergovernmental relations and it attempts to address the difficulties experienced by most large bureaucracies in coordinating their government functions and streamlining their administrative activities.

The Constitution of the republic of South Africa, created three spheres of government which are the national, provincial and local spheres. All these spheres are "distinctive, interdependent and interrelated" and share the common responsibility of improving the quality of life of all through *inter alia* the fulfillment of fundamental rights. (Du Plessis 2005).

2.2 REVIEW OF COOPERATIVE GOVERNANCE BETWEEN THE THREE SPHERES OF GOVERNMENT

The Constitution sets the rules for the functioning of government. As already mentioned, there are three spheres of government in South Africa: national government, provincial government and local government. These spheres of government are autonomous and should not be seen as hierarchical. The Constitution states that the spheres of government are distinctive, inter-related and inter-dependent. At the same time, they all operate according to the Constitution and laws and policies made by the national Parliament.

Each government department is responsible for implementing the laws and policies decided on by Parliament. Every department prepares a budget for its work. The budgets are included in one national budget by the Treasury (Department of Finance or

the Cabinet). Some departments only exist at national level because they deal with issues that concern the whole country; the Department of Water Affairs is one of such departments. Provincial or local government may not do anything that is against the laws or policies set down by national government. In terms of section 154 of the Constitution of the Republic of South Africa (Act no 108 of 1996). The national and provincial governments, by legislative and other measures, must also support and strengthen the capacity of municipalities to manage their own affairs, to exercise their powers and to perform their functions.

Provincial government gets most of its money from the national government through the Treasury. Local government also gets grants and some loans through the Treasury. The Department of Cooperative Governance and Traditional Affairs (COGTA) (which resides at the national level) is responsible for national co-ordination of provinces and municipalities. In every province, the provincial departments and local government monitors and supports municipalities. There are three different kinds of municipalities in South Africa: metropolitan municipalities (Category A), local municipalities (Category B) and district municipalities (Category C).

Metropolitan municipalities exist in the six biggest cities in South Africa. The metropolitan municipality co-ordinates the delivery of services to the whole area. There are metropolitan municipalities in Johannesburg, Cape Town, Ethekwini (Durban), Tshwane (Pretoria), Nelson Mandela (Port Elizabeth) and the Ekhuruleni (East Rand) (as shown on Table 2.2). Areas that fall outside of the six metropolitan municipal areas are divided into local municipalities.

District municipalities are made up of a number of local municipalities that fall in one district. There are usually between three to six local municipalities that come together in a district council and there are 47 district municipalities in South Africa. The district municipality has to co-ordinate development and delivery in the whole district. It plays a stronger role in areas where local municipalities lack capacity to deliver especially in very rural areas. In this case district municipality will have more responsibility for development and service delivery. It has its own administration (staff).

Section 152 of the Constitution assigns local government the responsibility of providing democratic and accountable governance to its community, ensuring the provision of

sustainable services, promoting a safe and healthy environment and involving communities and community organisations in its matters, subject to compliance with national and provincial legislation.

In terms of Schedule 4 and 5 of the Constitution of the Republic of South Africa (Act no 108 of 1996) the municipalities are responsible for the following functions: electricity delivery, sewage and sanitation, refuse removal, municipal health services, municipal roads, street trading, parks and recreational areas, water for households use, stormwater systems, fire fighting services, decisions around land use, municipal public transport, abattoirs and fresh food markets.

The Division of Revenue Act, (Act No.2 of 2006) (DORA) lays down how the total government income (revenue) should be divided and allocated among the spheres of government and within government.

The different spheres of government depend on each other for support in project implementation and regular communication is essential. For example, when a municipality proposes the development of a new township in its Integrated Development Plan, health and education services have to be provided by provincial government. Water services have to be provided by national government, and finances for housing development have to be transferred from national to provincial government from where it goes to the housing developers approved by the municipality (http://www.etu.org.za/toolbox/docs/govern/inter.htm)

It was noted by the WRC (2006b) that with the challenges of implementation in an environment of shared responsibility, it is increasingly recognised that public/government institutions must foster institutional cooperation and interaction for efficient provision of public services, both at the policy-strategy level and the operational-implementation level. According to WRC (2006b), poor cooperation between institutions in the implementation of their interrelated mandates has resulted in inefficient utilization of scarce resources and/or endless disputes.

Section 41 of the Constitution refers to the principles of cooperative government. It states that all spheres of government and all organs of state within each sphere must co-operate with one another in mutual trust and good faith by:

(i) fostering friendly relations;

(ii) assisting and supporting one another;

(iii) informing one another of, and consulting one another on, matters of common interest;

(v) co-ordinating their actions and legislation with one another;

(vi) adhering to agreed procedures; and

(vii) avoiding legal proceedings against one another.

The Constitution further states that an organ of state involved in an intergovernmental dispute must make every reasonable effort to settle the dispute by means of mechanisms and procedures provided for that purpose and must exhaust all other remedies before it approaches a court to resolve the dispute. According to Bosman *et al* (2008), the requirements of cooperative governance prevent the taking of legal action against non-compliant local governments, unless after following a long process.

Water Sector edigest (2011:9) remarked that the management and delivery of water services will only be sustainable in an environment that is conducive to private sector involvement and where the government's regulatory role is instrumental.

2.2.1 Challenges of cooperative governance

(COGTA) (2009:19) remarked that the provincial departments are responsible for local government and the Offices of the Premier are responsible for the oversight, support and leadership of governance entities in provinces. Both offices have previously been found to be under-resourced, poorly structured and capacitated and often lacking a core focus on their oversight and governance mandates. Systemic weaknesses and low capacity translate into poor responsiveness and structural ability to act as a responsive sphere of government.

Table 2.1 COGTA (2009:20): Provincial budget allocations to local government programmes 2005/6

Province	***Budget on Local Government Programmes***	***% of Provincial Budget (net of HES)***
Eastern Cape	251,377,527	3.8%
Free State	55,418,000	1.9%
Gauteng	129,085,000	1.9%
Kwa-Zulu/Natal	271,212,000	3.3%
Limpopo	310,194,000	3.7%
Mpumalanga	146,083,134	4.2%
North West	77,000,000	0.5%
Northern Cape	106,255,475	7.6%
Western Cape	97,230,000	2.1%
Total/Median	**1,366,855,136**	**3.5%**

According to COGTA (2009:20), Table 2.1 indicates that most local government departments were found to be under-resourced, receiving only, on average, 3.5% of the provincial budget (excluding Health, Education and Social Development).

2.3 Current Situation of WWTW in Metropolitan Municipalities in RSA

In order to identify and develop the core competencies required for the water sector,, the Department of Water Affairs introduced the Green Drop regulation to ensure effective and efficient delivery of sustainable water services. If embraced and strengthened, this regulation will gradually and sustainably improve the level of wastewater management in South Africa. This form of incentive- and risk-based regulation holds the intent to synergise with the current goodwill exhibited by municipalities and existing Government support programmes to give the focus, commitment and planning needed. (Greed Drop Report, 2011).

According to the Green Drop Report (2012) as seen in Figure 2.1, all provinces with metropolitan municipalities indicated in Table 2.2 are doing well in terms of their compliance to the Green Drop Certification except for the Free State province.

Table 2.2 List of metropolitan municipalities

List of metropolitan municipalities		
Name	**Province**	**Seat**
Buffalo City	Eastern Cape	East London
City of Cape Town	Western Cape	Cape Town
City of Johannesburg	Gauteng	Johannesburg
City of Tshwane	Gauteng	Pretoria
Ekurhuleni Metropolitan	Gauteng	Germiston
eThekwini Metropolitan	Kwazulu-Natal	Durban
Mangaung Metropolitan	Free State	Bloemfontein
Nelson Mandela Bay	Eastern Cape	Port Elizabeth

These metropolitan municipalities are defined as Category A in terms of section 155 (1) (a) of the Constitution of the Republic of South Africa (Act no 108 of 1996). It is an area with strong interdependent social and economic linkages. The challenges of the Category A municipality are sustainability due to urbanisation and in-migration accompanied with high levels of household poverty (COGTA 2009). This category also requires more sophisticated urban management capacity and skills to deal with spatial planning, land-use management and infrastructure life-cycle management.

According to Figure 2.1, Limpopo and Northern Cape are the worst performing provinces. They are in a critical state and need some intervention for all aspects of the wastewater service business. The provincial department at Limpopo which is supposed to support the local government has more than half of its staff at grade 4 or below (COGTA 2009). This demonstrates the prevalence of junior staff and the lack of senior skills and experience within this key provincial department.

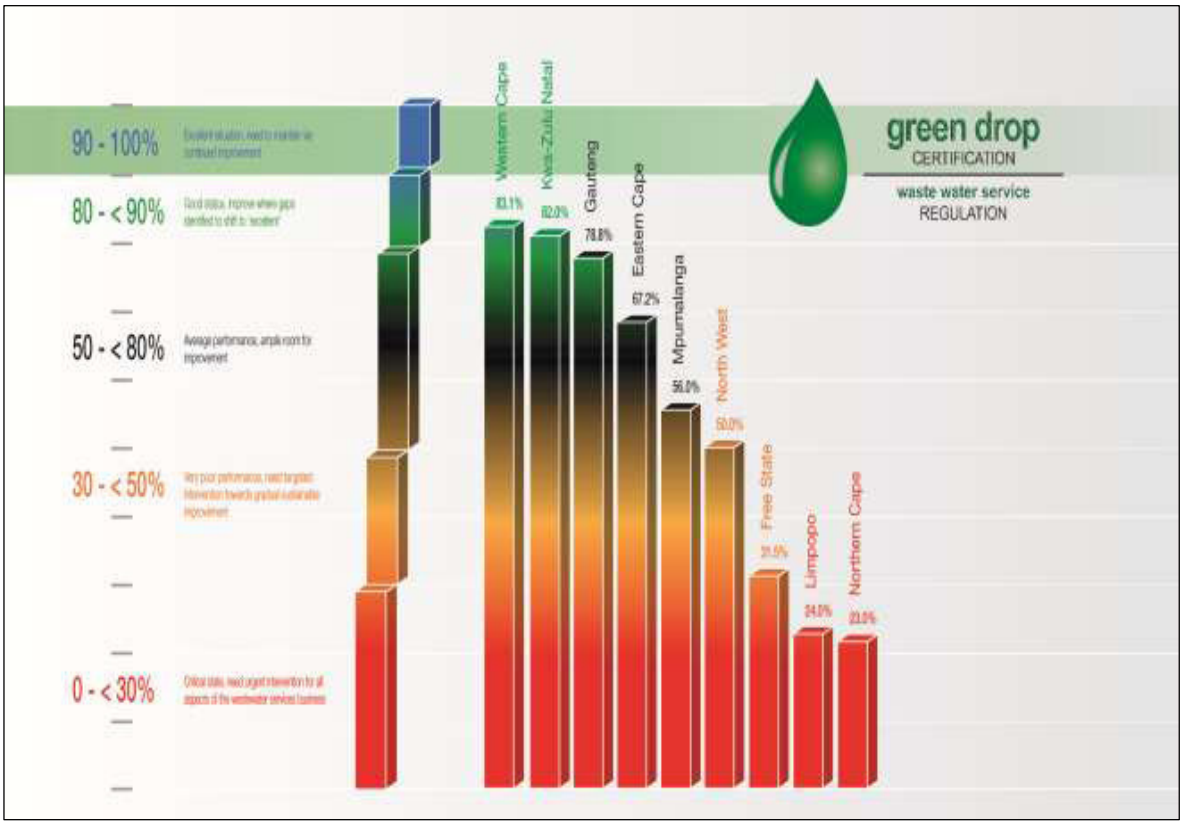

Figure 2.1: Status of each province in relation to Green Drop Certification Municipal scores. (Green Drop Report, 2012:4)

North West and Free State provinces have a very poor performance and require targeted intervention towards gradual sustainable improvement.

Mpumalanga, Eastern Cape and Gauteng provinces are performing on average and have ample room for development.

Aspects that are being considered when performing the Green Drop assessments are:

- Technology used
- Design Capacity (Ml/d)
- Operational % in terms of design capacity
- Microbiological Compliance
- Chemical Compliance
- Physical Compliance
- Annual Average Effluent Quality Compliance
- Wastewater Risk rating

- Highest Risk Area
- Risk abatement Process
- Description of Project Expenditure
- Wastewater Risk Abatement Planning

The Green Drop Report (2012:4) states that 33 systems were awarded Green Drop status in 2009 while in 2011, 40 systems were awarded Green Drop status. This reflects a slight increment in terms of WWTW compliance to following adoption of Green Drop initiative to entice municipalities to improve their water treatment services.

2.4 IMPACTS

Water pollution is the degradation of water quality as measured by biological, physical or chemical criteria. Poor operation and maintenance of WWTWs contribute to the pollution of water resources upon which most rural communities depend for all their domestic and other purposes (DWAF,2002).

- Increase in water- borne diseases:

  Due to the deterioration of WWTW conditions and resulting in pollution of water resources, there is an increase in the number of incidences of water-borne diseases. According to Bosman et al (2008), in the town of Delmas, a typhoid epidemic broke out in both 2002 and 2005, as a result of both inadequate sanitation systems and insufficient portable water treatment services by the municipality. In 2005, more than 3000 people fell ill and five fatalities were reported.

  According to Bosman et al (2008), in the town of Emfuleni, a total breakdown of the local government services relating to sewage treatment (pumping stations are continuously overflowing, and sewage works cannot handle the load of effluent) has caused chronic pollution of the Vaal River and Vaal Barrage, one of South Africa's major storage reservoirs, leading to regular fish kills and odour complaints from tourists visiting recreation resorts on the banks of the Vaal River.

- The Water Wheel (2008) reported that high risk of nutrient enrichment (eutrophication) conditions in the Vaal River is mostly due to sewage spills and

sewage effluent discharges into the Vaal River and its tributaries. Gauteng State of the Environment Report, (2004) reported that most of the major dams in Gauteng have unacceptable levels of eutrophication which have implications for human health and recreation.

- Poor water quality can have negative impacts on economic growth and social developments.

- According to the Department of Water and Environmental Affairs, the impact of poorly managed wastewater treatment works is the inability to sustain safe drinking water.

2.5 SUPPORT

In order to address the WWTW in the Upper Vaal, WMA has established a forum for water quality to provide support for water resource management issues and to give stakeholders an opportunity to participate during the CMA establishment process. According to the WRC (2006b), although this is an important vehicle for participation and it is critical for municipalities to be represented, it is not particularly suited for the specific type of interaction necessary to foster cooperative governance.

DWA launched the Green Drop Initiatives as part of its incentive-based regulation approach. Various policies, regulations, strategies and guidelines assist the water users in making sure they use water in a more sustainable way.

There are events like Water Week which are initiated as a vehicle for public awareness and information sharing on how to use, develop and manage the country's water resource.

2.6 INTERVENTIONS

Section 139 of the Constitution states that when a municipality cannot or does not fulfill an executive obligation in terms of the Constitution or legislation, the relevant provincial executive may intervene by taking any appropriate steps to ensure fulfillment of that

obligation, including issuing a directive to the municipal council, describing the extent of its failure to fulfill its obligations and stating any steps required to meet its obligations.

DWA as the national water services regulator follows the following process when the water services authority fail to conform:

- Section 19 letters: in the first instance DWA requests compliance in the form of writing the letter to the water services authority in terms of Section 19 of NWA.

- Directives: where a water services authority fails to respond to a request for compliance yet has the necessary capacity to comply, then DWA may issue a directive, which is a legal action against an 'offender' to remedy and non-compliance to a directive may lead to prosecution in terms of section 151 of NWA.

- Waste Discharge Charge System (WDCS) is a polluter pays principle for DWA which has not yet been implemented. This system aims to promote the sustainable development and efficient use of water resources; promote the internalisation of environmental costs by impactors; recover some of the costs of managing water quality; and create financial incentives for dischargers to reduce waste and use water resources in a more optimal way.

Bosman *et al* (2008) remark that the implementation of WDCS may have grave implications for the fiscus of a local government. With many municipalities already cash-strapped, it is uncertain what the remedies will be, should a municipality fail to pay the charges levied against it.

Section 7.3.2 (SALGA, 2003) states that in terms of regulating performance and compliance, where a water service authority fails to conform to legislative requirements, then DWAF as the national services regulator will follow the processes outlined below:

- In the first instance, DWAF must request compliance. If the water services authority expresses the intention to comply but at the same time an inability to

comply due to real constraints, then the water services authority will be supported.

- Where the water services authority fails to respond to a request for compliance yet has the necessary capacity to comply, then DWAF (working together with provincial government as necessary) may initiate any of the following initiatives aimed at securing compliance.
- The failure to comply can be published (possibly together with a league table of relative performance in the relevant area) in appropriate media to encourage the water services authority to comply through increased public pressure ('name and shame').
- DWAF (together with National Treasury, DPLG and provincial government as appropriate) could encourage compliance by applying financial pressure on the water services authority through the retention or holding back of capital funds (as contemplated in the Public Finance Management Act and the Division of Revenue Act).
- Where the previous two initiatives fail, or in cases where it is deemed serious enough to warrant direct intervention, DWAF could intervene (together with National Treasury, DPLG and provincial government as appropriate). Interventions could include running the water services for a limited period of time. Intervention by national and provincial governments is supported by the Constitution and provided for in legislation (Constitution, Sections 100 and 139; the Water Services Act, the Municipal Systems Act and the draft Municipal Finance Management Act). Where interventions are undertaken, these must be coordinated through provincial government and DPLG.
- If, despite all efforts, the local authority refuses to comply (or is negligent in compliance), DWAF may resort to legal action. It is likely that this action will be of a civil rather than criminal nature. This will allow for a range of remedies that may prohibit municipalities from undertaking certain actions or oblige municipalities to undertake certain actions. Legal action should be regarded as a last resort.

Bosman *et al* (2008) maintain that the demands of this process of intervention by the Strategic Framework for Water Services are evident, not only with regard to human resources, but particularly with regard to timeframes of implementation. It may take

years from identifying a problem of non-compliance to actually implementing the solution that will address the non-compliance. By the time the solution is being implemented, severe environmental degradation and effects on human health may have occurred. In addition, it creates a duplicate system of intervention, where compliance and enforcement for industries and mines follow a different route from intervention for local government.

2.7 CHALLENGES

2.7.1 Challenges for local government and/or water services authority

According to WRC (2006), there are significant differences between municipalities throughout South Africa in terms of their challenges, capacity, organization and approaches to performing their functions. WRC (2006) notes that most water resources managers do not know which directorates or departments to make contact with in a local government organization to achieve cooperation around a specific issue, leading to frustration, inefficiencies and inadequate cooperation. Nel (2007) remarked that one of the important challenges is the absence of, among others, skills, knowledge and capacity, resources, data, infrastructure as well as support. Moreover, in some cases mandates are not funded by other spheres of government, which results in inadequate implementation.

Nel (2007) states that for numerous local authorities environmental issues are not a priority at all; policy initiatives such as social development are higher on the political agenda. Mema (undated) found that poorly maintained WWTWs are comparable to factors resulting from lack of response from both local and national government. DWA (2009) states that financial support to deal with urgent issues at WWTW is, in many cases, non-existent. According to Mema (undated), the demand for water has increased due to economic expansion and population growth results in WWTWs operating under stress.

SALGA (2003) highlighted the following challenges in the form of motivation for the reform of water services provision in SA:

- Some water services providers are not financially viable.

- Poor revenue collection, rising input costs and downward pressure on retail water tariffs are placing many water services providers under financial pressure and are resulting in inadequate spending on maintenance and under-investment in rehabilitation. This will result in the deterioration of assets over time and a breakdown in service provision.
- Late payment and poor rates of payment are critical issues for many water services providers in SA.
- Considerable ongoing investment is required to expand and sustain water services infrastructure in SA.
- The capacity required for effective water services provision is in short supply in many parts of the country due to losses in human resource capacity through HIV/Aids.
- Shortage of accredited training providers.
- The current institutional framework for water services provision is highly fragmented, with a substantial number of water services institutions acting as water services providers. This fragmentation may result in loss of economies of scale, duplication of administration and technical functions, inability to attract and retain good management and technical staff and inability to invest in the development and training of specialist skills.

Other challenges faced by municipalities are the turnover of staff, the municipalities' inability to generate revenue, inadequate funding under the equitable share and the lack of finalisation of some legislation (Parliamentary Monitoring Group, 2009). Another challenge was lack of proper planning by WSAs (Parliamentary Monitoring Group, 2009).

According to the SA local government chronicle (2010) when municipalities failed to spend the Municipal Infrastructure Grant (MIG) which was allocated to them by (COGTA), Minister of COGTA, Sicelo Shiceka said: "The inability of municipalities to spend vindicates the correctness of a call for the urgent establishment of a 'special purpose vehicle' as well as urgent employment of competent and professional personnel capable to perform duties diligently, effectively and efficiently".

COGTA (2009) indicates that whilst all of the support programmes have assisted in specific ways, it is still clear that a number of stubborn service delivery and governance

problems have been identified in municipalities over several years. These remain consistently at the forefront of government's developmental challenges. These priority areas include:

- Huge service delivery and backlog challenges, e.g. housing, water and sanitation;
- Poor communication and accountability relationships with communities;
- Problems with the political administrative interface;
- Corruption and fraud;
- Poor financial management, e.g. negative audit opinions;
- Number of (violent) service delivery protests;
- Weak civil society formations;
- Intra- and inter-political party issues negatively affecting governance and delivery; and
- Insufficient municipal capacity due to lack of scarce skills.

COGTA (2009) indicates that provincial assessments exposed causes of distress in municipal governance. These included:

- tensions between the political and administrative interface;
- poor ability of many councilors to deal with the demands of local government;
- insufficient separation of powers between political parties and municipal councils;
- lack of clear separation between the legislative and executive;
- inadequate accountability measures and support systems and resources for local democracy; and
- poor compliance with the legislative and regulatory frameworks for municipalities.

According to COGTA (2009), a culture of patronage and nepotism is now so widespread in many municipalities that the formal municipal accountability system is ineffective and inaccessible to many citizens. The lack of a common vision and a coordinated approach between national and provincial departments regarding supervision of the municipal system with no clear approach to support and intervention is one of the critical factors in the state of distress municipalities (COGTA 2009).

2.7.2 Challenges for DWA national and/or provincial government

Water Wheel (2010) indicated:

- Despite the fact that the water policy developed in South Africa is considered to be world class, a number of challenges to implement remain.
- High rate of staff turnover results in an overstressed government department.
- Loss of staff members means that existing knowledge is not being transferred to new recruits.

Currently the Department is facing the issue of Occupation Specific Dispensation (OSD) which has its challenges that are impacting on the process of filling vacant posts especially in the field of science, engineering and legal services in order to address the issue of staff turnover. The OSD was an initiative to retain scarce skills and attract scarce skills due to competition from the private sector which is able to offer better salaries.

The Department cannot function effectively with shortage of staff, as it impacts negatively on the timeframes of issuing of water use licenses which further affects the economic growth of the country.

2.8 LEGISLATION

Water quality management of WWTW requires multi-level cooperative governance. The following legislation plays a role:

- The Constitution (Chapter 3) has specific reference to cooperative governance which gives a broad framework on how to manage interrelated mandates. Section 155(7) of the Constitution gives the national and provincial spheres the executive authority to oversee the performance of municipalities in relation to their functions.
- National Water Act (No. 36 of 1998) (NWA): The NWA provides the framework for the utilization, development and protection of the country's water resources. It legislate wastewater discharge into the water resource.
- Water Services Act 108 of 1997: the Act provides the framework that should guide the provision of water services.

- Local Government: Municipal Systems Act 32 of 2000: This Act ensures universal access to essential services that are affordable to all. Other mechanisms include performance management systems to assess municipalities' performance.
- Local Government: Municipal Financial Management Act, 2003 (Act 56 of 2003). The objectives of this Act to secure sound and sustainable management of the fiscal and financial affairs of municipalities and municipal entities by establishing norms and standards and other requirements for -
  (a) ensuring transparency, accountability and appropriate lines of responsibility in the fiscal and financial affairs of municipalities and municipal entities:
  (b) the management of their revenues, expenditures, assets and liabilities and the handling of their financial dealings
  (c) budgetary and financial planning processes and the co-ordination of those processes with the processes of other spheres of government:
  (d) borrowing;
  (e) the handling of financial problems in municipalities;
  (f) supply chain management: and
  (g) other financial matters.
- Intergovernmental Fiscal Relations Act 97 of 1997: This Act is responsible for investment in water services infrastructure.
- By-laws: Local government may establish by-laws around a range of activities that affect water resource management (WRM). These by-laws must be aligned with WRM legislation and approaches.

2.9 ROLES OF ORGANISATIONS CURRENTLY INVOLVED IN THE MANAGEMENT OF WWTW

2.9.1 The Department of Water Affairs (DWA)

DWA is the national department responsible for both water resources management and water services provision. This Department has the constitutional responsibility to support and strengthen the capacity of local government in the fulfillment of its functions and to regulate local government to ensure effective performance of its duties. Where water services fail to provide efficient, effective and sustainable services, this Department has the duty to enforce and monitor compliance with the NWA.

As the custodian of water resources, DWA fulfills the following functions with regard to Water Resource Management in accordance with the National Water Act (No. 36 of 1998) (NWA) and the Water Services Act (No. 108 of 1997):

Table 2.3: Functions of National Water Act and Water Services Act.

National Water Act (No. 36 of 1998)	*Water Services Act (No. 108 of 1997)*
Sector policy and Strategy Development	Water Services Planning
Water resource protection	Developing and Maintaining Policy and Strategy
Regulating water use	Regulation and Intervention
National Planning	Monitoring and Auditing

2.9.2 The Department of Cooperative and Traditional Affairs (COGTA)

The Department of Cooperative Governance and Traditional Affairs (COGTA) responsible for the relationship between the national government and the provincial governments and municipalities, and for overseeing the traditional leadership of South Africa's indigenous communities.

COGTA regulates and oversees the activities of local government. It allocates funds including the municipal infrastructure grant and capacity building grant. The Constitution accord the local government a significant role in the promotion and protection of the right to social protection. In order to achieve its developmental mandate, local government is imbued with executive and legislative authority in respect of, and has the right to administer the local government matters.

2.9.3 Water services authorities (WSA) (metropolitan municipalities, some district municipalities and authorised local municipalities)

WSAs are responsible for ensuring provision of water services within their area of jurisdiction. Municipalities supply water and sanitation to consumers (households, businesses and industries) and operate wastewater collection and treatment systems. In terms of section 152 of the Constitution, one of the stated objectives of municipalities is

to promote a safe and healthy environment; and they must strive, within their financial and administrative capacity, to achieve this objective.

Section 68 of the Local Government: Municipal Systems Act 32 of 2000 provides that a municipality must develop its human resource capacity to a level that enables it to perform its functions and exercise its powers in an economical, effective, efficient and accountable way, and for this purpose must comply with the Skills Development Act, 1998 (Act 81 of 1998), and the Skills Development Levies Act, 1999 (Act 28 of 1999).

2.9.4 National Treasury

The National Treasury monitors and regulates the finances of all public bodies as set out in the Public Finance Management Act 1 of 1999 and the Municipal Financial Management Act No.56 of 2003. It manages the impact of local government fiscal activities on national economic policies and support DWA in fulfilling their support and regulatory roles.

2.9.5 Water Boards

Some Water Boards operate wastewater systems. WRC (2009) reported that Water Boards have an important role to play in the operation and maintenance function of rural water treatment plants.

2.9.6 Other

Other organisations assist in the management of WWTW, such as the Development Bank of Southern Africa (DBSA). According to Water Sector Water Sector edigest (2011) the DBSA is engaging National Treasury to seek special approvals for water and sanitation projects. Due to the institutional capacity constraints of most under-resourced municipalities, the Bank is also proactively assisting municipalities in the preparation and packaging of applications to the National Treasury. The Bank further aims to help improve the municipalities' financial status especially with respect to reducing non-revenue water.

CHAPTER 3: SITUATION ANALYSIS: COOPERATIVE GOVERNANCE: UPPER VAAL AS CASE STUDY

3.1 State of the Upper Vaal

3.1.1 Description

The Upper Vaal Water Management Area is one of 19 WMA's in South Africa. Its major rivers include the Grootdraai, Wilge, Klip and Vaal and cover the following dams:

- Boskop Dam Mooi River
- Grootdraai Dam Vaal River
- Klerkskraal Dam Mooi River
- Klipdrift Dam Loop Spruit
- Potchefstroom Dam Mooi River
- Saulspoort Dam Liebenbergvlei
- Sterkfontein Dam Nuwejaar Spruit
- Vaal Dam Vaal River

The southern half of the area extends over the Free State; the north-east mainly falls within Mpumalanga and the northern and western parts in Gauteng and North West provinces respectively. It is a pivotal water management area in the country (DWAF, 2004). There is extensive urbanisation, mining and industrial activities taking place in the area. As a result of the high level of urbanisation and economic activity, water resources in this water management area are highly developed and impacted upon by humans. The Upper Vaal WMA is economically important, contributing nearly 20% of the Gross Domestic Product of South Africa, which is the second largest contribution to the national wealth among all 19 WMAs in the country.

The Upper Vaal is divided into 13 sub catchments which are namely the Grootdraai, Waterval, Vaaldam, Wilge, Suikerbosrant, Blesbokspruit, Rietspruit, Upperklip, Rietklip, Lowerklip, Upper Wonderfontein, Lower Wonderfontein, Mooi River and Leeutaai.

The map of the Upper Vaal Water Management Area showing WWTW in the Upper Vaal is found in Annexure B.

Grootdraai

There is extensive coal mining in this sub-catchment. The Grootdraai Dam is of strategic importance as it supplies water to power stations as well as Sasol. Therefore, the water quality of the Leeuspruit and Blesbokspruit needs to be managed carefully as their waters could have negative impacts to this dam.

Waterval Catchment

Extensive mining and industrial activities are present in the Waterval catchment. The Sasol Mining II and III complexes, Evander mining operations and the Sasol Synfuels are the major users in Waterval catchment. The major towns are Secunda, Kinross and Evander.

Wilge

Wilde River transports the water transferred from Katse Dam via the Lesotho Highlands and this renders the water of good quality because of high dilution.

Upperklip, Rietklip and Lowerklip

The Klip River drains the Greater Johannesburg region, which includes some heavily urbanised and industrialised areas (including Soweto, Lenasia, Eldorado Park, Germiston, and Boksburg).

Leeutaai/Taaibos

The Taaibosspruit tributary drains the Sasolburg industrial complex and the surrounding areas.

Upper and Lower Wonderfontein and Mooi River

These sub-catchments' land use is heavily impacted by extensive mining activity and urbanized areas (Far West Rand Basin and numerous sewage treatment plants). These activities cumulatively discharge large quantities of mine water and sewage effluent that eventually drain into the Vaal River.

3.1.2 Water Quality in the Upper Vaal WMA

Water quality in the Vaal River as well as some tributaries to the Vaal River is seriously affected as a result of mines, farmers, urban, dense settlements and industrial users. According to the Water Wheel (2009), the major source of water pollution include uncontrolled sewage, poorly managed wastewater treatment works, chemical discharges, petroleum leaks and spills, dumping in old mines and pits, human settlements, and agricultural chemicals that are washed off or seep down from farm fields. According to the Water Wheel (2009), the Vaal dam is one of the dams that is known to be (nutrient enrichment) eutrophic.

The current water quality challenge facing the Upper Vaal WMA is acid mine drainage (AMD) in the Witwatersrand Goldfields consisting of the western, central and eastern mining basins. These basins have been mined for over 130 years, and some of the mining companies no longer exist. Edigest Water Sector (2011) states that AMD is acidic water that forms when water reacts with minerals voided by mining, which are then exposed to air. The AMD water has low pH (high acidity), high salinity levels, elevated concentrations of sulphate, iron, aluminium and manganese, raised levels of toxicity heavy metals, and possibly even radionuclides. It is responsible for costly environmental and socioeconomic impacts. According to Edigest Water Sector (2011), the AMD occurs in disused and ownerless mines, where historically water was continuously pumped out to keep working areas dry. When mining activities stopped thereby also stopping the pumping this resulted in decanting of mine water into natural water courses threatening the health, safety and environmental and economical risks. Since government cannot trace the owners of these mines to command them to remediate them, government should remediate the pollution. The Minister of Finance allocated R225 million to the issue of AMD. DWAF (2004) found that the water quality of the Grootdraai Dam is under threat from the current mining activities.

3.2 Reasons for this situation are as follows:

Department of Water and Environmental Affairs (2009), indicated that the uncontrolled sewage and poorly managed wastewater treatment works, in the Upper Vaal WMA is a lack of skilled contractors who render services and poor construction supervision, which diminishes the life expectancy of infrastructure; lack of municipal staff (especially

engineers, scientists and technicians) to operate and maintain water services infrastructure; and absent or weak municipal systems for infrastructure management. According to Mema (undated), many studies found that the cause of untreated sewage and poor quality wastewater discharges is due to the poor plant designs, overloaded capacity, poor operation and maintenance and faulty equipments of municipal WWTWs. DWA also delays in the processing of water use licenses. The management of WWTW discharges through the licensing process is essential and there is a problem of compliance with regard to local authorities (DWAF 2004).

According to the Water Wheel (2009) eutrophication is caused by agricultural and urban runoff, municipal and industrial wastewater effluents. Septic tank leach fields all contribute to plant nutrients such as phosphorus and nitrogen compounds.

In terms of the AMD issues, the previous government did not take pre-cautionary measures to ensure that those who were practising mining activities took responsibility to remediate the impacts.

3.3 Case study of the Standerton WWTW

The Standerton WWTW is in Lekwa Local Municipality. The plant was struggling to comply with DWA General and Special Standards of effluent discharge into the Vaal River water resource. The plant was supposed to comply with this standard due to it not having the water use licence which is a requirement of the DWA for anyone who is exercising water use in terms of the National Water Act, 1998 (Act 36 of 1998) section 21. The WWTW has been upgraded as the receiving flows have increased. The biofilter plant was constructed in the late 1950s. The plant was upgraded later by the addition of one activated sludge module in 1974 followed by a second module that was constructed in 1986. There is no design or operating manual available for the WWTW. The reasons for non-compliance to final effluent standards were:

- The lack of regular maintenance of the WWTW with evidence of corrosion, inoperable pumps, worn biofilter bearings, inoperable monitoring equipments.
- The site has been subject to vandalism which significantly impacts on the proper operation of the plant; cabling and metal structures have been stolen leaving process units non-functional. Vandalism of the pumps has also resulted in seepage of waste from various sumps around the WWTW that has also resulted in seepage of waste from various sumps around the WWTW that gravitates into a channel flowing to the river discharge point. The drying beds can no longer be used for drying waste activated sludge as the decanting handstop have been stolen. There is no scheduled maintenance programme and at the time of inspection there were no in-house artisans available to undertake repairs and maintenance work.
- Neither the flow rate nor the chemical composition of the influent was monitored at the time and no records could be provided of the historical data. According to the Concept Design Report (2010) the flows have not been recorded since 2004.
- Housing development has increased in the area increasing the number of households connected to the sewer system, however in the absence of daily flow measurements and regular monitoring it cannot be confirmed whether the WWTW is operating at, or has exceeded design capacity.
- Standerton WWTW is registered with DWA and has been classified as a Class B works. Staffs employed at the WWTW were not suitably qualified or appropriately classified to operate a Class B WWTW in accordance with Regulation 2834 and no maintenance staffs were available. Inadequate budgetary provision was made for routine maintenance and emergency repairs.

Source: Department of Water Affairs, November 2010. Emergency Response Facility in Standerton WWTW, Lekwa Municipality Report and Recommendations of required interventions.

The situation described in this case study resulted in this WWTW scoring 19.0% for the Municipal Green Score in the Green Drop Report (2011) and was considered to be into a maximum risk space of 100%. In the Green Drop Report (2012) the situation has moved to medium risk of 54%.

3.4 Summary

The most critical factors affecting the water quality status of the Upper Vaal Water Management Area are the extensive coal and gold mining activities and large volumes of poorly untreated sewage wastewater being discharged into the water resource.

CHAPTER 4: ASSESSMENT OF COOPERATIVE GOVERNANCE IN THE UPPER VAAL

4.1 Methodology

A literature review was conducted to gather information on research methodology. The method of data collection in the empirical inquiry was in the form of questionnaires. The Department of Water Affairs and Municipality employees were the targeted respondents to the questionnaires. In the Department of Water Affairs most respondents were officers in areas with catchments in the Upper Vaal Water Management Area in the Directorate of Water Quality Management and Water Sector Support. Municipality respondents were employed in the municipalities under the Upper Vaal Water Management Area. A sample of 50 respondents was made.

4.2 Research design and method

The questionnaire was designed in such a way that the identity of the respondents was protected; names of the respondents were not required. The questionnaires focused on the focus topic of the problem statement. Questions 10 to 18 used the Likert scale system wherein 1= low and 10=high.

4.3 Data analysis

The collected data was entered and processed using the Statistical Package for the Social Sciences software (SPSS). The SPSS program generated all significant correlation. Data is represented in a form of descriptive and inferential statistics.

Questions 1 to 9 were analysed and the results presented according to a bar chart. The collected data from questions 10 to 18 was analysed using IBM SPSS Statistical software and were used to gauge an accurate view of the respondents' opinions. The software generated all significant correlations. Data has been represented in a form of descriptive statistics and inferential statistics. According to Research Methods 1 Handouts (2000), descriptive statistics summarise the data, making clear any trends or patterns, which may be lurking within them; they consist of visual displays such as graphs and summary statistics such as means. Inferential statistics attempt to make

inferences about the parent population on the basis of the limited samples actually obtained.

4.4 Results

4.4.1 The results of Questions 1 to 9 presented in the form of bar charts

Question 1: Do any formal cooperative governance structures exist that should be followed when managing WWTW's? The results are given in Figure 4.1.

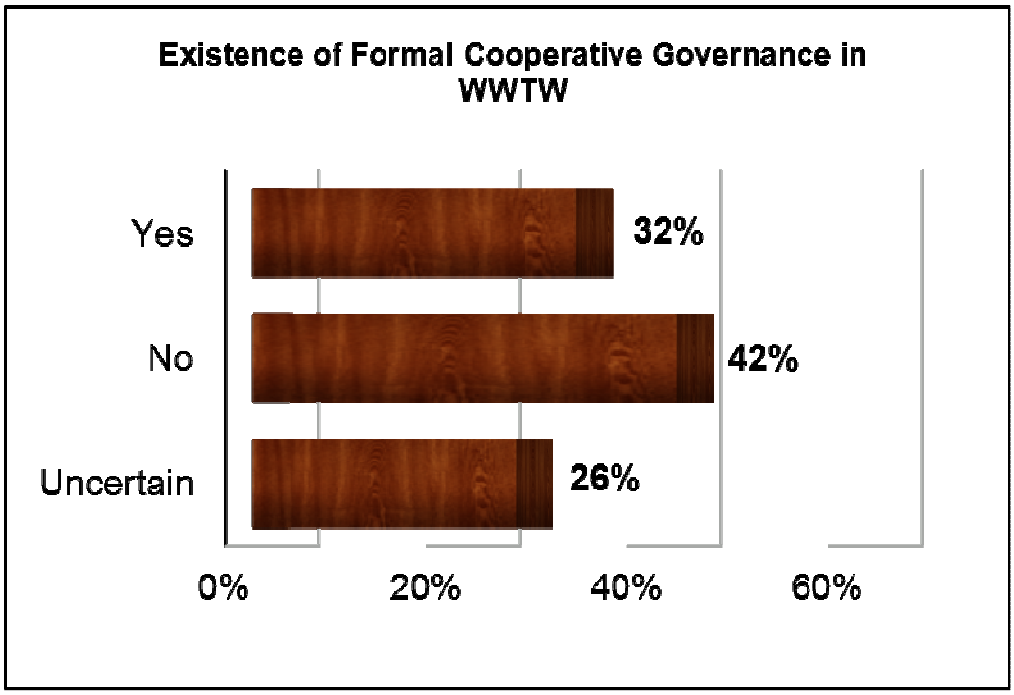

Figure 4.1 Existence of formal Cooperative Governance structures in WWTW

The results indicate that 42% of the respondents state there are no formal cooperative governance structures and 26% of the respondents are uncertain. The latter implies that if the structures exist, they are not aware of them. What is troubling is that there seems to be a strong difference of opinion on whether formal cooperative structures exist, which can be indicative of poor communication. As a result this can affect performance of WWTW as cooperative governance is not known nor is there any authorised structure to receive and address complaints lodged against any non compliance.

Question 2: Do you think there is a good stakeholder relation in the management of WWTW? The results are given in Figure 4.2.

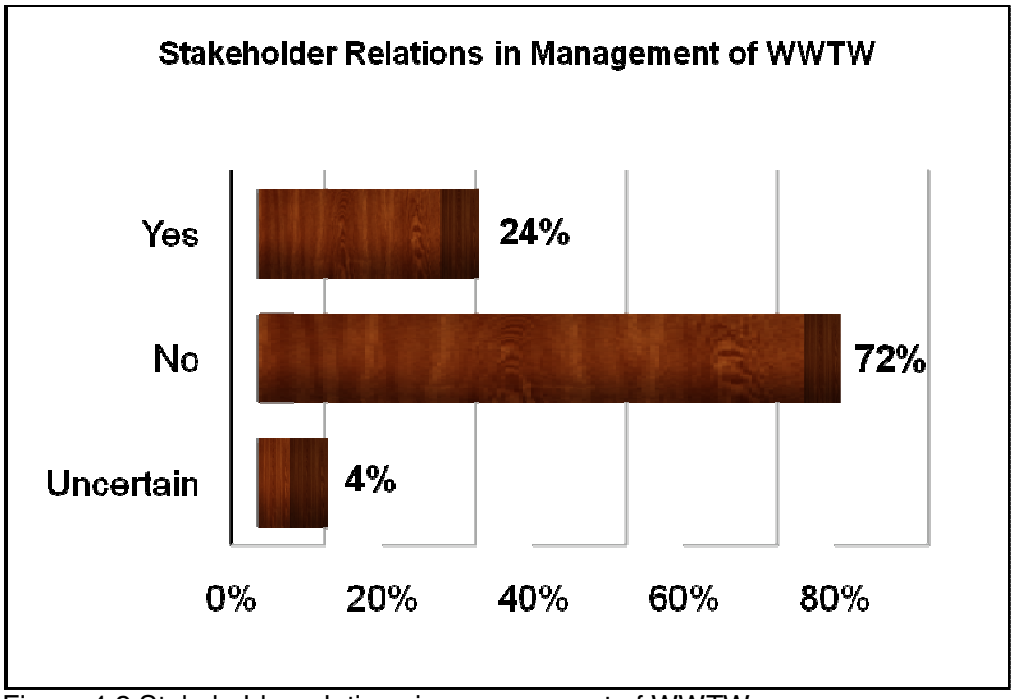

Figure 4.2 Stakeholder relations in management of WWTW

The key stakeholders in the management of WWTW are the Department of Water Affairs, local government, COGTA and SALGA. 72% of respondents say there are no stakeholder relations, which correlates well with 42% of respondents who say there are no formal cooperative governance structures. Some respondents are uncertain. Indeed this reflects a sad situation within this catchment and thus needs some immediate attention in order to sustain water quality.

Question 3: Do you think housing sector takes into consideration the capacities of WWTW before developing an area and ensure that where required the capacity of WWTW is upgraded before the completion of the development? The results are given in Figure 4.3.

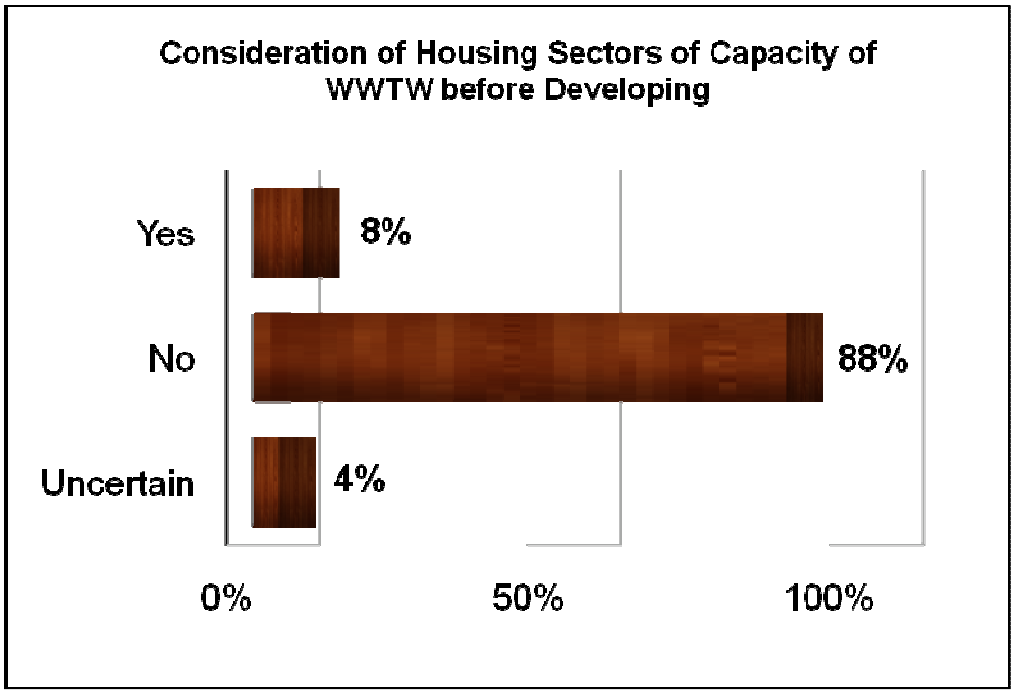

Figure 4.3 Consideration of housing sector of capacity of WWTW before developing

The results indicate that 88% of respondents feel that the housing sector does not consider the capacity of WWTW when developing. This area of study also covers the Category A municipality, which is the City of Johannesburg. The Category A municipality experiences challenges of sustainability due to urbanisation and in-migration (COGTA, 2009).This may result in an overloaded WWTW (currently one of the major challenges of WWTW) which ends up in raw sewage overflowing into the water resource and/or partially treated effluent. The Bushkoppies WWTW and Olifantsvlei WWTW are operating slightly above their capacity with Bushkoppies WWTW at 104.5% operational capacity and Olifantsvlei WWTW at 102.5% operational capacity (Green Drop Report (2012:197).

Question 4: Do you think the WWTW management is getting the priority in terms of distribution of finances? The results are given in Figure 4.4.

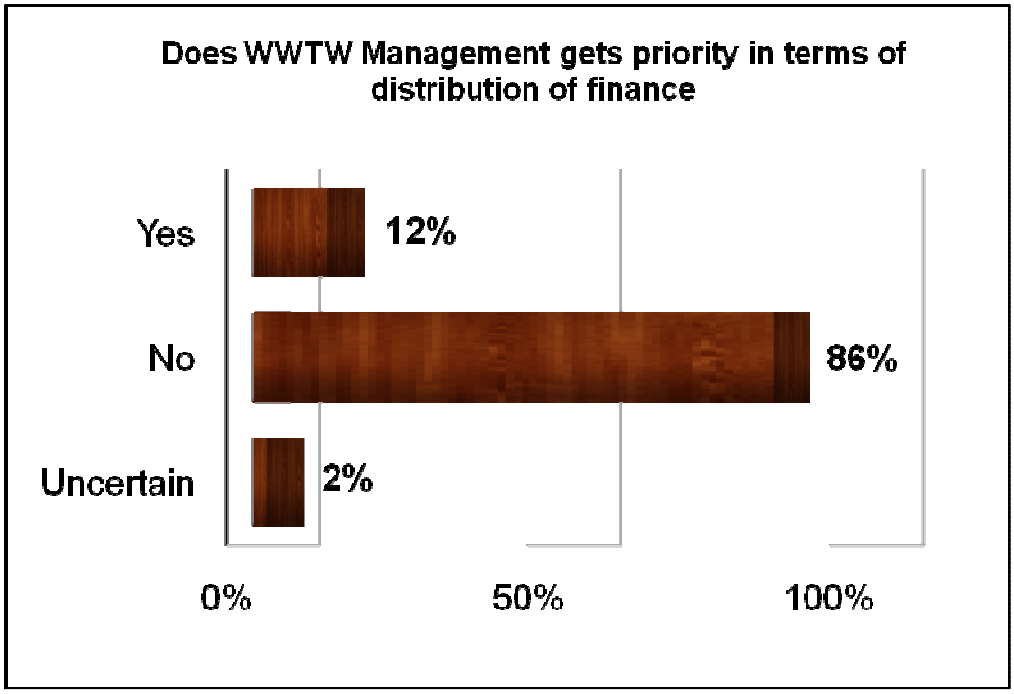

Figure 4.4 WWTW management's priority in terms of distribution of finance.

86% of respondents strongly believe that the WWTW is not getting enough funds for it to perform to standard. The results indicate that the management of WWTW is not being prioritised during budget allocation. Table 2.1 which indicates the provincial budget allocations to local government programmes 2005/6 (COGTA, 2009:20), correlates with these findings. COGTA (2009:75) further indicated that root causes of credible budgets are that budgets are not aligned to expectations for service delivery; insufficient capacity to plan/budget correctly; and over and/or under expenditure. The issue of non-regulation of competency levels for critical positions (e.g., middle and senior municipal management for technical heads of infrastructure, Chief Financial Officers (CFOs) (COGTA 2009:31) can also add to challenges of inappropriate distribution or allocation of budget. COGTA (2009:87) listed municipalities in financial distress, including ones with WWTW falling under Upper Vaal WMA as Maluti-a-Phofung, Phumelela, Ngwathe and Westonaria. According to Green Drop Report (2012:217), the Green Drop status of the WWTW in the financial distressed municipalities is poor with Hannes van Niekerk

WWTW (Westonaria Municipality) having a continued situation of pump station failure and pipe breakage whereby 11 Ml/day is lost through the network without reaching the treatment facility which is regarded as critical. The Green Drop Report (2012:165) indicates the status of Kestell, Tshiame, Harrismith and Phuthaditjhaba WWTWs' (Maluti-a-Phofung Municipality) as having a poor progress indicator according to the risk analysis trend from 2008 to 2012. All these four WWTW's share the problems of poor effluent compliance and non-compliance with R2834 for operating staff. Except for the Harrismith WWTW that had 80 million for capital and refurbishment expenditure for 2010/2011, the other WWTWs' were at R0.0 million or no information. The Green Drop Report (2012:183) indicated the status of Vredefort and Parys WWTW in Ngwathe Municipality as not showing any progress when looking at the risk trend analysis from 2008 to 2012 due to the lack of influent flow monitoring, no effluent compliance monitoring and non-compliance with R2834 with regard to operating and maintenance staff. The Green Drop Report (2012:186) indicated that the status of Vrede, Memel and Warden WWTWs' in the Phumelela Municipality as not showing any progress in terms of risk trend analysis from 2008 to 2012 due to lack of influent monitoring and non-compliance with R2834 with regard to operating and maintenance staff.

Question 5: Do you think the majority of WWTW process controllers are skilled to do the work? The results are given in Figure 4.5.

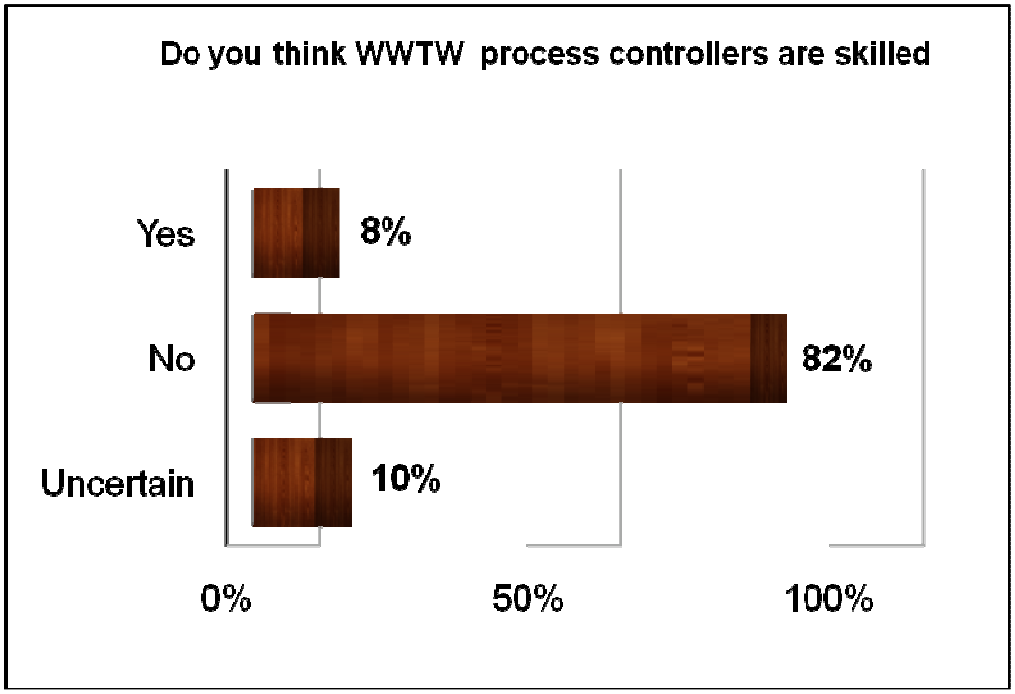

Figure 4.5 Skills of WWTW process controllers

Figure 4.5 shows that 82% of the respondents do not regard the process controllers as skilled. This results correlates with the findings of the Green Drop Report (2011),wherein it reported that the lack of appropriately skilled process controllers was noted and the Department is rolling out a process control training programme nationally which will contribute to enhanced treatment of wastewater (Green Drop Report, 2011).

Question 6: Do you think the Water Quality Management Forums are effective in solving challenges of Water Quality in the Upper Vaal Water Management Area? The results are given in Figure 4.6.

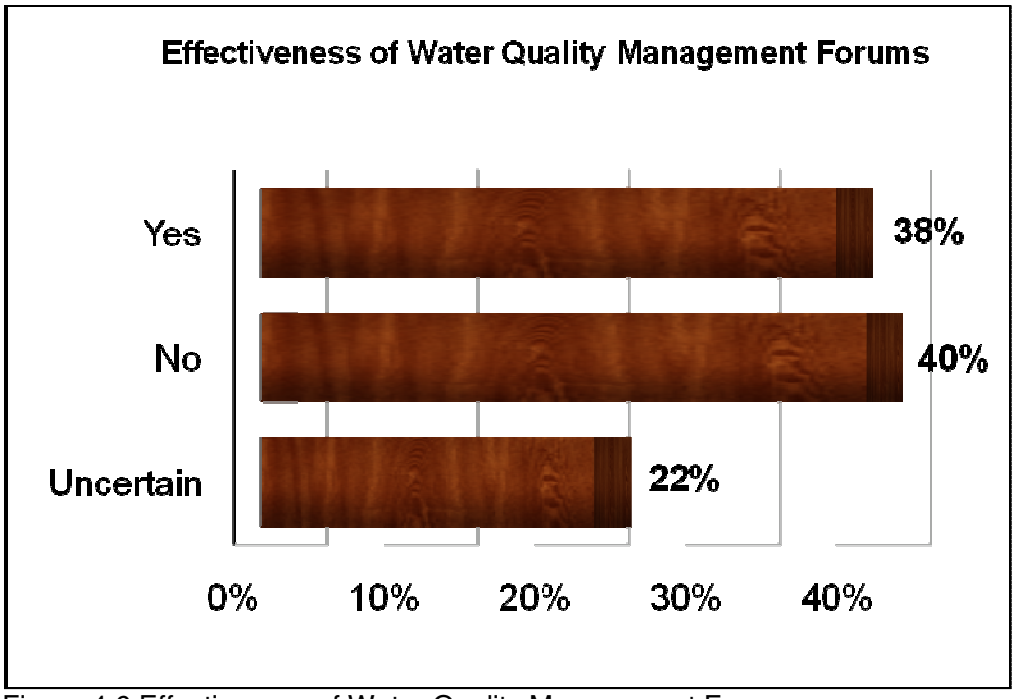

Figure 4.6 Effectiveness of Water Quality Management Forums

The findings indicate that respondents share almost equal views in terms of those who say the forums are effective and those who do not regard them as effective. The Upper Vaal Water Management Area holds Water Quality Management Forums on a quarterly basis. The catchment forum is a formal structure which is related to the Catchment Management Agency (CMA). It is formed mostly by government departments, non-governmental organizations, local authorities, industries, mines, water service providers and agriculture within the specific catchments. It is the platform where cooperative and consultative water quality issues are discussed, solutions are brainstormed and recommendations can also be made to the authorities by all participants. (http://www.reservoir.co.za).

Question 7: Do you think that COGTA has succeeded in addressing the alignment of planning that should exist between national, provincial and local government and stopped the challenges wherein spheres of government were working in silos? The results are given in Figure 4.7.

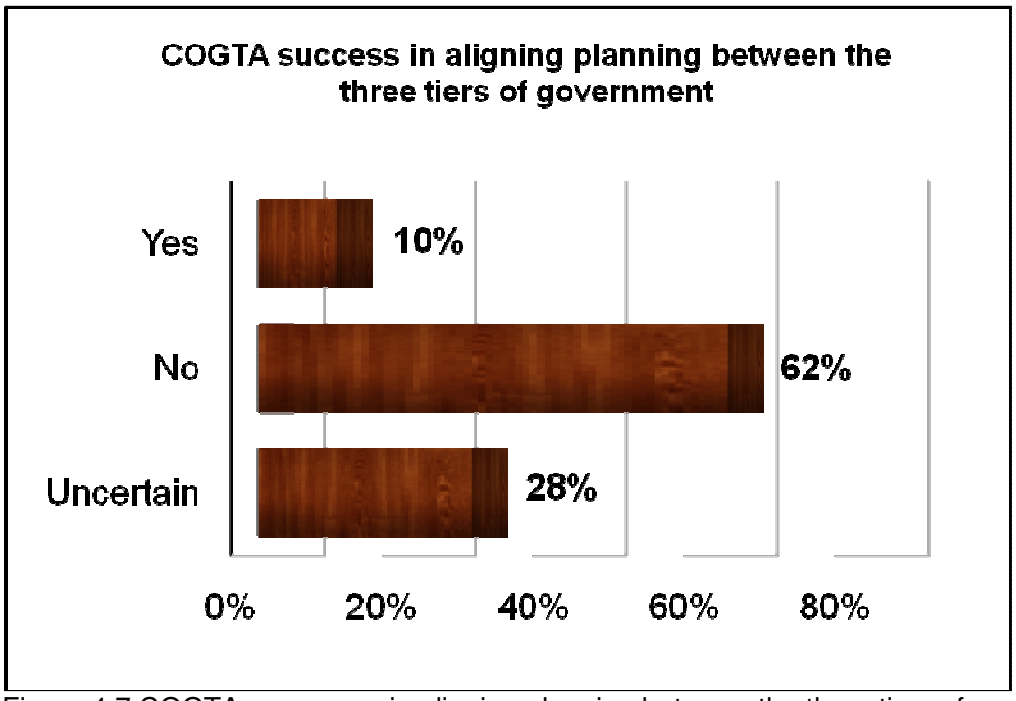

Figure 4.7 COGTA successes in aligning planning between the three tiers of governance

The results correlates with the results in Figure 4.2 that there is no strong stakeholder relations, as 62% of respondents strongly feel that COGTA is not doing enough in terms of aligning planning between the three tiers of government.

Question 8: Do you think that the slow pace of the Department of Water Affairs in issuing water use licenses has a negative influence in the performance of local government? The results are given in Figure 4.8.

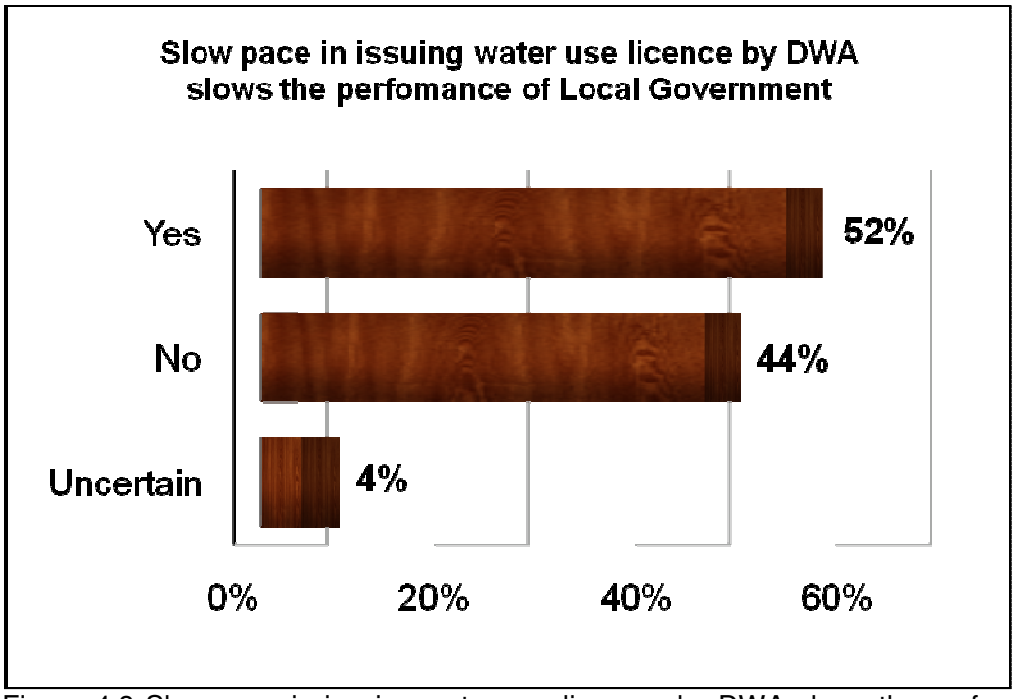

Figure 4.8 Slow pace in issuing water use licenses by DWA slows the performance of local government

According to the Official Newsletter of the Department of Water Affairs Shota (2011), which explains the process of a water use licence application, the administration and processing of Water Use Licence Applications (WULA) is a rigorous and complex task that requires a feasible business process. The results show that 52% of respondents believe that the WULA backlog has an influence on the status of the WWTW while 44% do not agree that the existence of a water use licence in a WWTW can make any impact on the way the plant is operating. The Department of Water Affairs has come up with an initiative to address the WULA backlog called the Letsema project wherein a group of officers specializing in processing WULA are deployed only to do WULAs. This is based on the findings that apart from high staff turnover, the officers responsible for this function had to perform other functions. Beside the Department faces delays from the applicant. Sometimes the Department requests additional information to be able to

process the application further and the applicant only submits the information after a long time. In terms of local government, the municipality may not have sufficient funding to undertake the feasibility study (COGTA 2012:40).

Question 9: Do you think that the Department of Water Affairs is applying the policy of zero-tolerance approach towards the non-complying municipalities? The results are given in Figure 4.9.

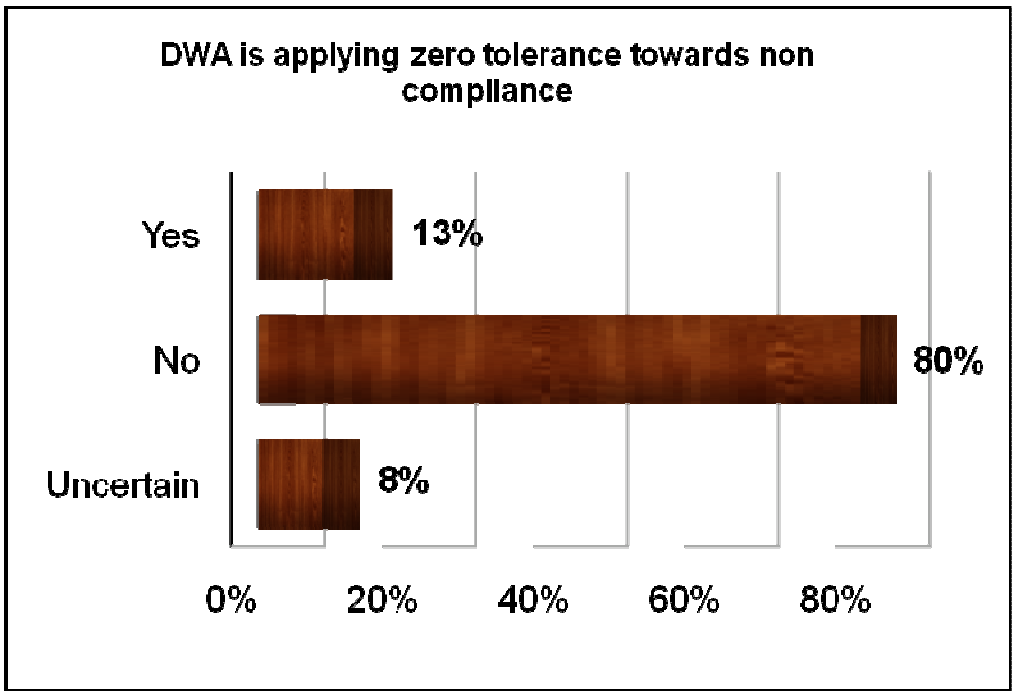

Figure 4.9 DWA is applying zero tolerance towards non-compliance

According to Figure 4.9, 87 % of respondents strongly believe that DWA is very lenient towards non-compliance of the National Water Act (Act 36 of 1998) by the municipalities in terms of the management of WWTW.

4.4.2 Questions 10 to 18 (results analysed using SPSS statistical software)

Table 4.1 Descriptive statistics: WWTW elements that affect the water quality

Descriptive Statistics WWTW elements that affect the water quality by all respondents					
	N	Minimum	Maximum	Mean	Std. Deviation
Awareness of municipalities on compliance with R2834	50	1.00	10.00	5.38	2.43
Awareness of WWTW staff regarding existing formal cooperative governance structures.	49	1.00	9.00	3.55	1.68
Support and commitment that District Municipality might be offering the Local Municipalities in terms of WWTW quality management	49	1.00	7.00	3.53	1.69
Technical skills of the majority of WWTW process controllers at grassroots level	50	2.00	8.00	3.86	1.32
Are cooperative governance structures are being implemented in the management of the WWTW for which you are responsible	49	1.00	7.00	3.53	1.54
Does the Green Drop Certification incentive-based regulation approach improves the level of wastewater management in South Africa?	49	1.00	10.00	**6.30**	1.87
Effectiveness of the Department of Water Affairs in enforcement of compliance to the National Water Act	48	1.00	10.00	4.12	2.06
Effectiveness and efficiency of local government in achieving its key objective of service delivery in terms of water and sanitation supply services?	49	1.00	10.00	4.69	2.14
Effectiveness of the Department of Water Affairs in managing and monitoring the Bulk Regional Infrastructure Fund for Water Services to deal with ageing wastewater treatment works	50	1.00	10.00	5.48	2.28
Performance of the Department of Water Affairs of moving from the role of support to increased regulation of local government	50	1.00	10.00	4.96	2.10

Table 4.2 Different Management level descriptive analysis

SENIOR MANAGEMENT (level 13 and above) Descriptive Analysis	**N**	**Minimum**	**Maximum**	**Mean**
Awareness of municipalities on compliance with R2834	4	1.00	9.00	4.5000
Awareness of WWTW staff regarding existing formal cooperative governance structures.	4	4.00	9.00	5.7500
Support and commitment that District Municipality might be offering the Local Municipalities in terms of WWTW quality management	4	2.00	7.00	4.2500
Technical skills of the majority of WWTW process controllers at grassroots level	4	4.00	7.00	5.0000

Are cooperative governance structures being implemented in the management of the WWTW for which you are responsible?	4	3.00	7.00	5.0000
Does the Green Drop Certification incentive-based regulation approach improve the level of wastewater management in South Africa?	3	7.00	9.00	**7.6667**
Effectiveness of the Department of Water Affairs in enforcement of compliance to the National Water Act	4	1.00	10.00	5.0000
Effectiveness and efficiency of local government in achieving its key objective of service delivery in terms of water and sanitation supply services	4	1.00	10.00	5.5000
Effectiveness of the Department of Water Affairs in managing and monitoring the Bulk Regional Infrastructure Fund for Water Services to deal with ageing wastewater treatment works	4	6.00	10.00	**7.7500**
Performance of the Department of Water Affairs of moving from the role of support to increased regulation of local government	4	5.00	10.00	**6.2500**
MIDDLE MANAGEMENT (LEVEL 9-12) DESCRIPTIVE ANALYSIS	**N**	**Minimum**	**Maximum**	**Mean**
Awareness of municipalities on compliance with R2834	22	2.00	10.00	**6.2273**
Awareness of WWTW staff regarding existing formal cooperative governance structures.	22	1.00	6.00	3.7273
Support and commitment that District Municipality might be offering the Local Municipalities in terms of WWTW quality management	21	1.00	6.00	3.6667
Technical skills of the majority of WWTW process controllers at grassroots level	22	2.00	8.00	3.8636
Are cooperative governance structures being implemented in the management of the WWTW for which you are responsible?	21	1.00	6.00	3.5714
Does the Green Drop Certification incentive-based regulation approach improve the level of wastewater management in South Africa?	22	1.00	8.00	**6.2727**
Effectiveness of the Department of Water Affairs in enforcement of compliance to the National Water Act	21	2.00	7.00	4.0952
Effectiveness and efficiency of local government in achieving its key objective of service delivery in terms of water and sanitation supply services	21	2.00	8.00	4.4286

Effectiveness of the Department of Water Affairs in managing and monitoring the Bulk Regional Infrastructure Fund for Water Services to deal with ageing wastewater treatment works	22	3.00	8.00	5.1818
Performance of the Department of Water Affairs of moving from the role of support to increased regulation of local government	22	1.00	7.00	4.6818
JUNIOR MANAGEMENT (LEVEL 6- 8) DESCRIPTIVE ANALYSIS	**N**	**Minimum**	**Maximum**	**Mean**
Awareness of municipalities on compliance with R2834	20	1.00	10.00	4.7000
Awareness of WWTW staff regarding existing formal cooperative governance structures.	20	1.00	5.00	2.8500
Support and commitment that District Municipality might be offering the Local Municipalities in terms of WWTW quality management	20	1.00	7.00	3.3000
Technical skills of the majority of WWTW process controllers at grassroots level	20	2.00	7.00	3.6000
Are cooperative governance structures being implemented in the management of the WWTW for which you are responsible?	20	1.00	6.00	3.3000
Does the Green Drop Certification incentive-based regulation approach improve the level of wastewater management in South Africa?	20	4.00	9.00	**6.0500**
Effectiveness of the Department of Water Affairs in enforcement of compliance to the National Water Act	20	1.00	8.00	3.8000
Effectiveness and efficiency of local government in achieving its key objective of service delivery in terms of water and sanitation supply services	20	1.00	9.00	4.6000
Effectiveness of the Department of Water Affairs in managing and monitoring the Bulk Regional Infrastructure Fund for Water Services to deal with ageing wastewater treatment works	20	1.00	9.00	5.6000
Performance of the Department of Water Affairs of moving from the role of support to increased regulation of local government	20	1.00	10.00	5.0000
EMPLOYEES BELOW LEVEL 6 DESCRIPTIVE ANALYSIS	**N**	**Minimum**	**Maximum**	**Mean**
Awareness of municipalities on compliance with R2834	1	6.00	6.00	**6.0000**

Awareness of WWTW staff regarding existing formal cooperative governance structures.	1	3.00	3.00	3.0000
Support and commitment that District Municipality might be offering the Local Municipalities in terms of WWTW quality management	1	5.00	5.00	5.0000
Technical skills of the majority of WWTW process controllers at grassroots level	1	4.00	4.00	4.0000
Are cooperative governance structures being implemented in the management of the WWTW for which you are responsible?	1	3.00	3.00	3.0000
Does the Green Drop Certification incentive-based regulation approach improve the level of wastewater management in South Africa?	1	3.00	3.00	3.0000
Effectiveness of the Department of Water Affairs in enforcement of compliance to the National Water Act	1	2.00	2.00	2.0000
Effectiveness and efficiency of local government in achieving its key objective of service delivery in terms of water and sanitation supply services	1	2.00	2.00	2.0000
Effectiveness of the Department of Water Affairs in managing and monitoring the Bulk Regional Infrastructure Fund for Water Services to deal with ageing wastewater treatment works	1	4.00	4.00	4.0000
Performance of the Department of Water Affairs of moving from the role of support to increased regulation of local government	1	4.00	4.00	4.0000

The results of whether the municipalities are aware of their compliance to R2834 in Question 10, scored the mean value of 5.38 which indicates an average; this implies a difference of opinion. The Green Drop Report (2012) indicates that those WWTW's that are not complying with R2834 are the ones whose municipalities have been listed (in the COGTA 2012) as in financial distress. R2834 is the regulation developed by DWA to register the WWTW and the process controllers. The WWTW is registered in the form of belonging to a certain classification. That classification indicates what levels of process controllers are required to operate in a specific WWTW. The level of process controllers is classified in terms of qualifications and experience in the relevant field, while the classification of the WWTW is according to the size of the plant and the type of technology used to treat the effluent.

The outcome results of WWTW's staff in the awareness of the existence of formal cooperative governance structures in Question 11, scored a mean value of 3.55 which indicates that certain WWTW staff are not aware of any existing structures. The issue of communication and capacity building is critical across all spheres of government.

The results of Question 12 of support and commitment that the district municipality might offer the local municipality in terms of WWTW quality management scored a mean value of 3.53. The majority of respondents are not convinced that the district municipality is assisting the local municipality. According to the HSRC (2003:4), the three roles of the district municipality are to build municipal capacity, to take on local municipal functions and to do district wide planning. The district municipalities should give support to local government.

The outcomes of the results for performance of technical skills of the majority of process controllers at grassroots level in Question 13 scored a mean value of 3.86 which indicates that some intervention is needed in terms of capacitating the process controllers.

The issue of the implementation of cooperative governance structures in the management of the WWTW in Question 14 scored a mean value of 3.53, which indicates ineffectiveness of cooperative governance. This results correlates with Figure 4.1. Communication channels must be strengthened among all spheres of government.

The outcome results of Question 15, on whether the Green Drop Certification incentive-based regulation approach improves the level of wastewater management in South Africa indicated a mean value of more than 5. This demonstrates strong agreement that this incentive-based regulation is working. This result correlates with the situation of the case study of Standerton WWTW wherein the plant was scored to be at maximum risk apace of 100% in the Green Drop Report (2011) and in Green Drop Report (2012) the plant is found to have improved to the medium risk score of 54%. However, the Green Drop alone cannot be the only reliable incentive. A host of the other entire variables become important. This is seen where some of the other WWTWs' failed to progress in risk trend analysis from 2008 to 2012 despite the intervention of the Green Drop.

The mean value of 4.12 was obtained on the effectiveness of the Department of Water Affairs' enforcement of compliance to the National Water Act in Question 16. These results indicate that the Department of Water Affairs is not implementing the policy to the full potential in terms of non-compliance. This Department should urgently investigate the issue of support through the implementation of regulations to prevent the public losing trust in the efficiency of the Department.

In terms of Question 17, the issue of the effectiveness and efficiency of local government in achieving its key objective of service delivery in terms of water and sanitation supply services, a mean value of 4.69 was obtained. This indicates poor performance. Crime such as fraud and corruption should be tackled as it hinders service delivery.

The effectiveness of the Department of Water Affairs in managing and monitoring the Bulk Regional Infrastructure Fund for Water Services to deal with ageing wastewater treatment works in Question 18, obtained the mean value of 5.48. This indicates a difference of opinion among respondents. This is a critical issue as ageing of infrastructures impact negatively on the water resource as it causes continuous bursting of pipes, leaking raw sewage into water resources and overloaded WWTWs' which overflow into the water resource.

The issue in Question 19, of the performance of the Department of Water Affairs of moving from the role of support to increased regulation of local government obtained the mean value of 4.96. This indicates that this Department has stopped fulfilling its supporting functions to the municipalities. This should be resolved on a political level as it requires change of policy since the Department has a mandate to support local government in terms of the Constitution.

4.4.3 Factor analysis of WWTW variables

Below is the factor analysis that the present writer applied in order to understand further the general clustering's of Water Quality Management WWTW variables. This method reduces the numerous WWTW variables analysed before into three dimensions. Rotation analysis was applied to improve interpretation. The analysis retained only three

dimensions with Eigen Values that were found to be greater than one. The total variance explained by the three variables is 64%. For interpretation the rule of thumb applied was that only factors greater than 0.6 were considered. Below is the output as run in SPSS version 20.

Table 4.3 shows that high percent of respondents at grassroots level indicated that cooperative governance is not being implemented and also support that there must be awareness campaign to ensure sustainable approach that must be employed to enhance WWTW within the sector.

Table 4.3 Eigen Values

Component	Initial Eigen values			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.979	39.786	39.786	2.410	24.099	24.099
2	1.389	13.888	53.674	2.282	22.818	46.917
3	1.070	10.700	64.374	1.746	17.457	64.374

Table 4.4 Rotated Component Matrix

Rotated Component Matrix			
	Component		
	1	2	3
Awareness of municipalities on compliance with R2834	.006	**.787**	-.123
Awareness of WWTW staff regarding existing formal cooperative governance structures.	**.623**	.362	-.133
Support and commitment that District Municipality might be offering the Local Municipalities in terms of WWTW quality management	.031	-.134	**.862**
Technical skills of the majority of WWTW process controllers at grassroots level	**.614**	.229	.326
Are cooperative governance structures are being implemented in the management of the WWTW for which you are responsible?	**.846**	-.208	.137
Does the Green Drop Certification incentive-based regulation approach improves the level of wastewater management in South Africa?	.294	**.750**	.099
Effectiveness of the Department of Water Affairs in enforcement of compliance to the National Water Act	.572	.212	.110
Effectiveness and efficiency of local government in achieving its key objective of service delivery in terms of water and sanitation supply services	.547	.516	.387
Effectiveness of the Department of Water Affairs in managing and monitoring the Bulk Regional	.158	**.641**	.487

Infrastructure Fund for Water Services to deal with ageing wastewater treatment works			
Performance of the Department of Water Affairs of moving from the role of support to increased regulation of local government	.436	.365	**.661**

This study uses the Principal Component Analysis (PCA) technique as applied by Darroch et al (2006) in their study to summarise small holder farmers' perceptions of factors that constrain the competitiveness of a formal organic crop supply chain in Kwazulu-Natal, South Africa. This research used the same method in analyzing the results, by using the information contained in a number of correlating variables (in this case responses to questions 10 to 18). Darroch et al (2006) used the PCA to retain the principal components (PCs) depending on the percentage of the variation in the original variables accounted for by each PC and to see whether the PC can be meaningfully interpreted. The PCs can be estimated as linear functions of the original questionnaire, questions 10 to 18. In this case the three PCs explained 64 % of the variance in the respondents' scores extracted from the rotated component matrix using the SPSS statistical package. Darroch et al (2006) retained PCs that meet Kaiser's criterion (Eigen Values of one or above), have estimated component loadings greater than 0.3 and can be meaningfully interpreted, wherein the SPSS statistical programme rounds off Eigen values greater than 0.5 to one by default. The factor analysis method is hereby applied also for clustering of variables and for explanatory purpose. The components in yellow strongly agree that there is a need for awareness on cooperative governance, technical support and skills at the grassroots level to enhance performance of WWTW in the Upper Vaal, as indicated in Table4.4 above.

PC_1 High technical skills of the majority of WWTW process controllers at grassroots level are associated with awareness of WWTW staff regarding existing formal cooperative governance structures. These groups of employees also believe in the implementation of cooperative governance structures in the management of the WWTW. This component relates to skilling as a means to ensure the awareness of cooperative governance.

PC_2 Employees that believe municipalities are complying with R2834 also believe that the Green Drop Certification incentive-based regulation approach improves the level of wastewater management in South Africa. These employees also relate this to the

effectiveness of the Department of Water Affairs in managing and monitoring the Bulk Regional Infrastructure Fund for Water Services to deal with ageing wastewater treatment works. The component relates to the need for more incentive approaches to water treatment as well as increased compliance with R2834.

PC_3 Increasing performance of the Department of Water Affairs by moving from the role of supporter to increased regulator of local government has a bearing on the level of support and commitment that the district municipality offers the local municipalities in terms of WWTW quality management. This component relates to the positive impact of the regulation by DWA on the support that trickles down from district municipalities to local municipalities.

The above analysis indicates that some of the Wastewater Treatment Works (WWTW) in the Upper Vaal Water Management Area are not complying with the Department of Water Affairs Water Quality Standards and authorisation. Such activities are bound by the National Water Act in terms of registration and authorisation to ensure that best practices and proper management practices are in place and to ensure compliance to the required effluent quality standards and other water use specification. This non-compliance causes deterioration of the water resource.

4.5 Summary

The local government role in this function is to provide the service by treating the influent in the WWTW that is mostly composed of domestic and industrial waste water. The national government as the custodian of water resources and the leader and regulator of the water services sector should further strengthen its role in this function to regulate the local government in terms of monitoring whether the function performed is complying with the requirements of the National Water Act, 1998, (Act 36 of 1998). Regulation is important to ensure effective and efficient delivery of sustainable water services. The non-compliance of the WWTW indicates gaps between these levels of government; this research proved lack of cooperative governance to be one of the challenges in this regard. In order to strengthen the role of compliance, training employees is identified in the analysis as a prerequisite. Training also improves awareness of the importance of cooperative governance structures.

Analysis also revealed that increased regulation ensures district municipality support and commitment to the local municipalities in terms of WWTW quality management. The positive impact of the regulation by DWA affects the support that eventually trickles down from district municipalities to local municipalities.

CHAPTER 5: SYNTHESIS

5.1 Conclusion

Section 41 of the Constitution makes provision for cooperative governance. In order to ensure cooperative governance, the three spheres of government, namely national, provincial and local government, each have interrelated environmental responsibilities and mandates to carry out which are interrelated but different. This mainly helps in ensuring sustainable service delivery in each sphere without conflict with one another. The aim of this research was to determine the effects of cooperative governance in the wastewater treatment works in the Upper Vaal Water Management Area.

The results of this study reveal that wastewater treatment works in the Upper Vaal are ineffective as a result of non-compliance by the three spheres of governance towards sustainable water quality. This is further supported by the literature review conducted, which indicates problems in local government, cooperative governance and the Department of Water Affairs. The local government problems highlighted a lack of skills; knowledge and capacity, resources, data and ageing infrastructure. Issues related to national and provincial governance highlighted high staff turnover and failure to implement the policy. This inquiry into the importance of cooperative governance highlighted challenges created by under-resourcing, poor structures, lack of capacity and often a lack of core focus on oversight and governance mandates by provincial government.

Based on the questionnaires results, it can be concluded that the three spheres of government should strengthen communication as there was a strong difference of opinions whether formal cooperative structures exist. The results indicated that senior management strongly believes that the cooperative management structures exist. This view was not shared by middle and junior management and this suggests a need for capacity on these levels and for improved information sharing. The question of good stakeholder relations was also highlighted as a major issue requiring attention in order to promote friendly relations. This recommendation extends to the outcomes of the results on the effectiveness of Water Quality Management forums wherein a strong difference of opinions was indicated. The recommendation regarding the improvement of

communication among all spheres of government also relates to the issue of whether COGTA has succeeded in aligning planning among all three spheres of government.

The research results further revealed a most critical issue highlighted by 88% of respondents who believe that the housing sector does not take into account the capacity of WWTW before undertaking developments. Spheres of government must strongly exercise the principle of informing and consulting one another on matters of common interest as currently several WWTWs' are operating above their design capacity.

The research results revealed that the strong likelihood that WWTW management is not prioritised during budget allocations. This issue should be carefully scrutinized as inappropriate funding can result in serious dysfunction in the operation of WWTW. The Green Drop Report indicated the poor performance of WWTWs' for those plants falling under municipalities in financial distress. The Green Drop Report (2012:166) recommended management support and the appropriate allocation of resources for implementation of corrective actions to improve the compliance with the Green Drop. Addressing underfunding will also allow the process controllers to attend relevant training as the research results together with Green Drop Report (2011) indicated that the majority of WWTW process controllers are not skilled to do their work.

The research results indicated the majority of respondents agree that the Department of Water Affairs does not apply the policy of zero-tolerance towards the non-complying municipalities. Should the Department of Water Affairs fail to implement zero tolerance, fulfill its functions as regulator and completely stop its functions of support, this will cause serious problems. It is expected of this Department to support and strengthen the capacity of municipalities to manage their own affairs, to exercise their powers and to perform their functions (The Constitution). The roles and responsibilities of the three spheres of government must be clearly outlined. Currently the Department cannot fully and freely exercise the enforcement of compliance to local municipalities.

The Green Drop incentive-based regulation seems to be the only working tool. Unfortunately management of WWTW cannot rely only on the Green Drop; there are several elements that must also be strengthened for the WWTW to function properly. The communication channels must be strengthened to make cooperative governance effective and efficient. This will assist in preventing or controlling situations where the

demand of the water resource becomes greater than the supply. Budget should be regulated properly as Figure 4.4 and the ensuing discussion indicates the impact of financially distressed municipalities on the operation of WWTWs'. Capacity building for process controllers and a top management committee should be established to intervene in the challenges faced by governance, local government and Department of Water Affairs.

Based on the literature review, the WWTW are not performing according to the required standards. The results of the empirical study indicated that the WWTW does not take priority during budget allocation and process controllers are not adequately skilled. Based on the findings of the research there is lack of cooperative governance and poor stakeholder relations among the key stakeholders responsible for the management of WWTW. The research results showed that the combination of lack of cooperative governance, lack of skills and lack of proper allocation of budget contribute to the poor performance of the WWTW. The research also demonstrated that senior management is more aware of the existence of formal structures of cooperative governance in the management of WWTW than the middle and junior management. The overall lack of capacity in both three spheres of government makes efficient operations of WWTWs almost impossible. The research results indicated that the Green Drop Certification has a positive impact on the improvement of WWTW.

5.2 Recommendations

Based on the results obtained, the following steps are recommended:

- There should be a joint effort between the local authority, DWA, COGTA and SALGA to formalise and strengthen the cooperative governance structures to be more effective in the management of WWTW. The roles and responsibilities for all spheres of government in these structures should be well understood to ensure that 'grey' areas in terms of their respective mandates are addressed quickly.
- In terms of lack of skilled process controllers, the DWA should continue with the plan of training the process controllers in the WWTW, as reported in the Green Drop Report (2011). Qualified and competent personnel should be appointed in all the three spheres of government.

- The roles of the three spheres of government should be clarified as to their respective responsibility to support small municipalities which struggle the most in terms of compliance and lack of skills and essential resources. This situation affects the overall performance of the WWTW. Clearly the roles of different spheres of government in this matter interrelate. This will allow the Department of Water Affairs to exercise its regulatory function effectively to non-complying Water Services Authorities in order to implement good practice of WWTW management. There should be consequences for non-performance of specified and agreed to duties in all spheres of government. If the government delays in its actions of failing to take action against non-compliance in the WWTW, other water users in the agriculture, industry and mining sectors will complain as to why their sectors are penalised while Water Services Authorities are not.
- The capacity of WWTW should be seriously considered when approving development, which will impact on the volume of influent in the WWTW.
- Senior management must share information and capacitate the middle and junior management.
- Government should ensure that the implementation of the policy and legislation is effective. According to Edigest Water Sector, (2011) South Africa's water sector policies and legislation are regarded as some of the best in the world.
- Water Services Authorities should budget adequately for operations and maintenance of WWTW to prevent funds from being misused and reallocated.
- Although the research results indicated that the Green Drop Certification is improving the performance of WWTW, this incentive-based regulation alone will not be enough to solve the challenges in WWTW management. Serious intervention and commitment from national, provincial and municipal political heads and their senior officials is vital.
- It is further recommended that other government departments, such as Human Settlement should consider the capacity of WWTW when initiating any development to avoid overloading of already overloaded and non functional WWTW.

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Appendix A: QUESTIONNAIRE

EFFECTS OF COOPERATIVE GOVERNANCE IN THE WASTEWATER TREATMENT WORKS (WWTW) IN THE UPPER VAAL WMA

Dear Participant

This questionnaire is part of my research for an Msc Environmental Management thesis on 'Effects of Cooperative Governance in the Wastewater Treatment Works (WWTW) in the Upper Vaal WMA'.

According to Ismail et al (1997), cooperative governance is an innovative concept to resolve problems related to intergovernmental relations and it attempts to address the difficulties experienced by most large bureaucracies in coordinating their government functions and streamlining their administrative activities.

Cooperative governance is meant to foster cooperation amongst the three spheres of government through adhering to the principles as set out in the South African Constitution, Chapter 3. The three spheres of government must:

- cooperate in mutual trust
- avoid legal proceedings against one another
- assist or support one another
- work together to promote and maintain peace and unity in SA etc.

Your participation in answering this questionnaire is voluntary. The information that you provide will be treated confidentially. All information obtained in this questionnaire will be used for research purposes only. The completion of the questionnaire will take approximately 10-15 minutes.

Thank you for taking the time out from your busy schedule to assist in filling this questionnaire.

Organisation:

Position:

SENIOR MANAGEMENT (level 13 and above)	
MIDDLE MANAGEMENT (level 9-12)	
JUNIOR MANAGEMENT (level 6- 8)	
EMPLOYEES below level 6	

Date:

Questionnaires

Question 1: Do any formal cooperative governance structures exist that should be followed when managing WWTW's?

Yes	No	Uncertain

If yes please list those structures.

Question2: Do you think there is a good stakeholder relation in the management of WWTW?

Yes	No	Uncertain

Question 3: Do you think housing sector takes into consideration the capacities of WWTW before developing an area and ensure that where required the capacity of WWTW is upgraded before the completion of the development?

Yes	No	Uncertain

Question 4: Do you think the WWTW management is getting the priority in terms of distribution of finances?

Yes	No	Uncertain

Question 5: Do you think the majority of WWTW process controllers are skilled to do the work?

Yes	No	Uncertain

Question 6: Do you think the Water Quality Management Forums are effective in solving challenges of Water Quality in the Upper Vaal Water Management Area?

Yes	No	Uncertain

Question 7: Do you think that COGTA has succeeded in addressing the alignment of planning that should exist between national, provincial and local government and stopped the challenges wherein spheres of government were working in silos?

Yes	No	Uncertain

Question 8: Do you think that the slow pace of the Department of Water Affairs in issuing water use licences has a negative influence in the performance of local government?

Yes	No	Uncertain

Question 9: Do you think that the Department of Water Affairs is applying the policy of zero-tolerance approach towards the non-complying municipalities?

Yes	No	Uncertain

Question 10: On a scale of 1 to 10, (1=low and 10 = high) assess the awareness of municipalities on compliance with R2834 (Regulation R 2834 is for the registration of the WWTW and process controllers) with regard to operating and maintenance of staff?

1	2	3	4	5	6	7	8	9	10

Question 11: On a scale of 1 to 10, (1=low and 10 = high) assess the awareness of WWTW staff regarding existing formal cooperative governance structures.

1	2	3	4	5	6	7	8	9	10

Question 12: On a scale of 1 to 10, (1=low and 10 = high) assess the support and commitment that District Municipality might be offering the Local Municipalities in terms of WWTW quality management.

1	2	3	4	5	6	7	8	9	10

Question 13: On a scale of 1 to 10, (1=low and 10 = high) assess the technical skills of the majority of WWTW process controllers at grassroots level (i.e. personnel involved with the day to day operations and maintenance of package plants)?

1	2	3	4	5	6	7	8	9	10

Question 14: On a scale of 1 to 10 (1 = low and 10 = high), assess whether cooperative governance structures are being implemented in the management of the WWTW for which you are responsible

1	2	3	4	5	6	7	8	9	10

Question 15: On a scale of 1 to 10 (1 = low and 10 = high), assess whether the Green Drop Certification incentive-based regulation approach improves the level of wastewater management in South Africa.

1	2	3	4	5	6	7	8	9	10

Question 16: On a scale of 1 to 10 (1 = low and 10 = high), assess effectiveness of the Department of Water Affairs in enforcement of compliance to the National Water Act to those municipalities that are not complying in terms of discharging final wastewater effluent of good quality ?

1	2	3	4	5	6	7	8	9	10

Question 17: On a scale of 1 to 10 (1 = low and 10 = high), assess the effectiveness and efficiency of local government in achieving its key objective of service delivery in terms of water and sanitation supply services?

1	2	3	4	5	6	7	8	9	10

Question 18: On a scale of 1 to 10 (1 = low and 10 = high), assess the effectiveness of the Department of Water Affairs in managing and monitoring the Bulk Regional Infrastructure Fund for Water Services to deal with ageing wastewater treatment works?

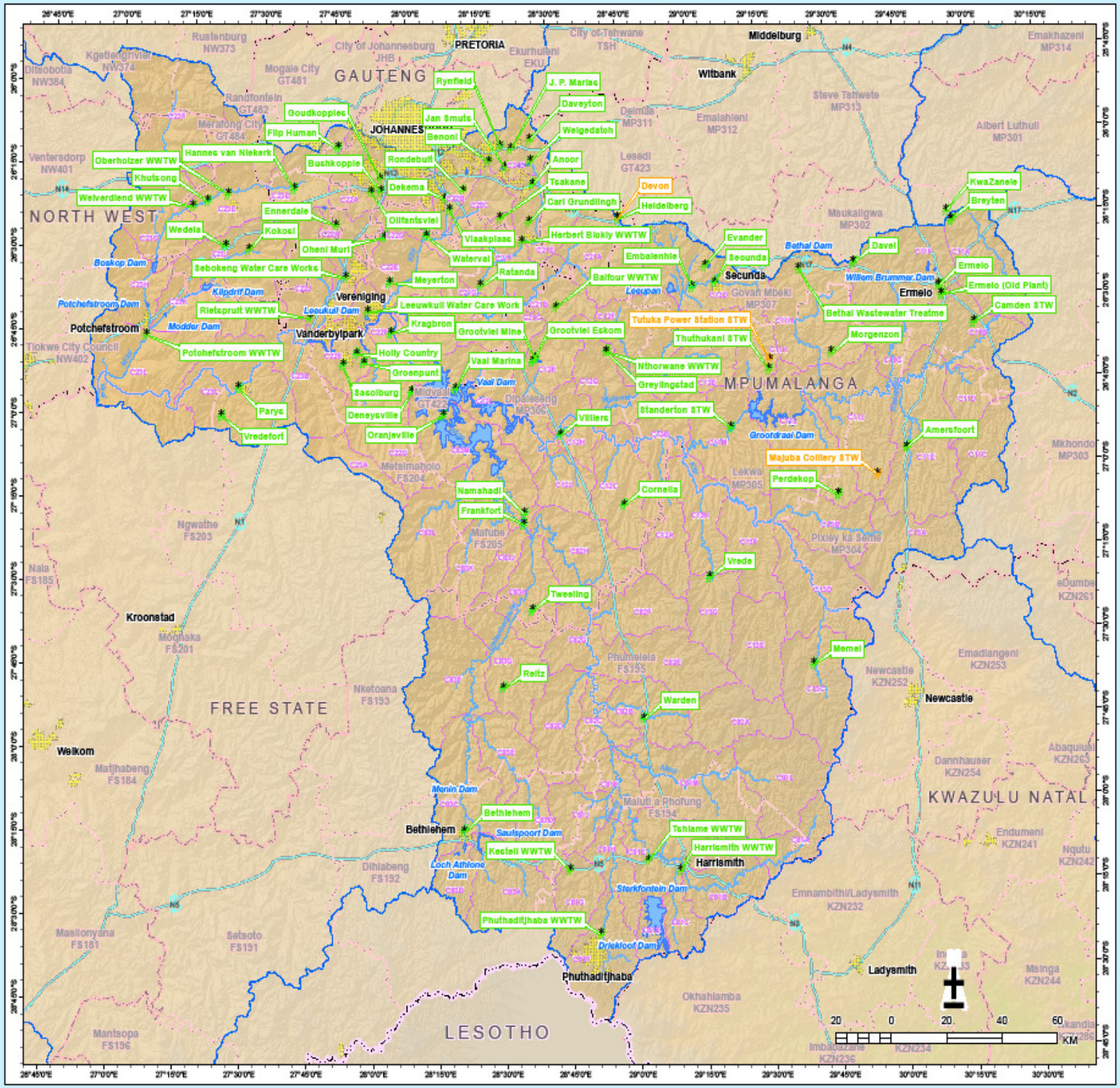
1	2	3	4	5	6	7	8	9	10

Question 19: On a scale of 1 to 10 (1 = low and 10 = high), assess the performance of the Department of Water Affairs of moving from the role of support to increased regulation of local government.

1	2	3	4	5	6	7	8	9	10

Question 20 - Any additional comments:

Appendix B: Map showing Municipalities WWTW in the Upper Vaal WMA



WMA 8
UPPER VAAL

WASTE WATER TREATMENT WORKS

LEGEND

Waste Water Treatment Works

- Private
- Public - Municipal
- Major City/Town
- Dam
- River
- Water Management Area
- Quaternary Catchment
- Road N Route
- International Boundary
- Provincial Boundary
- District Municipality
- Local Municipality

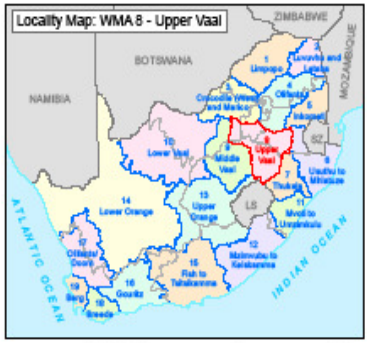
Data Acknowledgements:

The coastline, international boundaries, cities, towns, roads, rivers, dams and elevation layers: Chief Directorate: National Geospatial Information, Department of Rural Development and Land Reform.

Provincial boundaries, Local Municipalities and District Municipalities (Feb2006) : Municipal Demarcation Board.

Conservation Areas: Department of Environmental Affairs

Drainage regions, Water Management Areas and Waste Water Treatment Works : Department of Water Affairs



Mapping: Directorate Spatial & Land Information Management (SLIM)
Map compiled: August 2012
Map Ref: GM12_121
Plotfile: WMA8_WWTW_A3.png